

# 연습문제 답안

## 제1장

### 연습문제 1

- |                                                                      |            |             |
|----------------------------------------------------------------------|------------|-------------|
| 1. 19 kg                                                             | 2. 16 m    | 3. 479 mm   |
| 4. -66                                                               | 5. 565 원   | 6. -225     |
| 7. -2136                                                             | 8. -36121  | 9. £107701  |
| 10. -4                                                               | 11. 1487   | 12. 5914    |
| 13. 189 g                                                            | 14. -70872 | 15. \$15333 |
| 16. $d = 64 \text{ mm}$ , $A = 136 \text{ mm}$ , $B = 10 \text{ mm}$ |            |             |

### 연습문제 2

- |                           |                          |
|---------------------------|--------------------------|
| 1. (a) 468 (b) 868        | 2. (a) 1827 원 (b) 4158 원 |
| 3. (a) 8613 kg (b) 584 kg | 4. (a) 351 mm (b) 924 mm |
| 5. (a) 10304 (b) -4433    | 6. (a) 48 m (b) 89 m     |
| 7. (a) 259 (b) 56         | 8. (a) 1648 (b) -1060    |
| 9. (a) 8067 (b) 3347      | 10. 18 kg                |
| 11. 29                    | 12. 14000                |

### 연습문제 3

- |                      |                      |
|----------------------|----------------------|
| 1. (a) 4 (b) 24      | 2. (a) 12 (b) 360    |
| 3. (a) 10 (b) 350    | 4. (a) 90 (b) 2700   |
| 5. (a) 2 (b) 210     | 6. (a) 3 (b) 180     |
| 7. (a) 5 (b) 210     | 8. (a) 15 (b) 6300   |
| 9. (a) 14 (b) 420420 | 10. (a) 14 (b) 53900 |

### 연습문제 4

- |       |       |       |       |        |       |
|-------|-------|-------|-------|--------|-------|
| 1. 59 | 2. 14 | 3. 88 | 4. 5  | 5. 33  | 6. 22 |
| 7. 68 | 8. 5  | 9. 2  | 10. 5 | 11. -1 |       |

### 연습문제 5

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (c)  | 2. (c)  | 3. (b)  | 4. (a)  | 5. (a)  | 6. (b)  |
| 7. (a)  | 8. (d)  | 9. (c)  | 10. (b) | 11. (d) | 12. (d) |
| 13. (c) | 14. (d) | 15. (b) |         |         |         |

## 제2장

### 연습문제 6

1.  $2\frac{1}{7}$
2.  $7\frac{2}{5}$
3.  $\frac{22}{9}$
4.  $\frac{71}{8}$
5.  $\frac{4}{11}$
6.  $\frac{3}{7}, \frac{4}{9}, \frac{1}{2}, \frac{3}{5}, \frac{5}{8}$
7.  $\frac{8}{25}$
8.  $\frac{11}{15}$
9.  $\frac{17}{30}$
10.  $\frac{9}{10}$
11.  $\frac{3}{16}$
12.  $\frac{43}{77}$
13.  $\frac{47}{63}$
14.  $1\frac{1}{15}$
15.  $\frac{4}{27}$
16.  $8\frac{51}{52}$
17.  $1\frac{9}{40}$
18.  $1\frac{16}{21}$
19.  $\frac{17}{60}$
20.  $\frac{17}{20}$
21. 14

### 연습문제 7

1.  $\frac{8}{35}$
2.  $2\frac{2}{9}$
3.  $\frac{6}{11}$
4.  $\frac{5}{12}$
5.  $\frac{3}{28}$
6.  $\frac{3}{5}$
7. 11
8.  $\frac{1}{13}$
9.  $1\frac{1}{2}$
10.  $\frac{8}{15}$
11.  $2\frac{2}{5}$
12.  $\frac{5}{12}$
13.  $3\frac{3}{4}$
14.  $\frac{12}{23}$
15. 4
16.  $\frac{3}{4}$
17.  $\frac{1}{9}$
18. 13
19. 15
20. 400리터
21. (a) 60억 (b) P 36억, Q 16억
22. 2880리터

### 연습문제 8

1.  $2\frac{1}{18}$
2.  $-\frac{1}{9}$
3.  $1\frac{1}{6}$
4.  $4\frac{3}{4}$
5.  $\frac{13}{20}$
6.  $\frac{7}{15}$
7.  $4\frac{19}{20}$
8. 2
9.  $7\frac{1}{3}$
10.  $\frac{1}{15}$
11. 4
12.  $2\frac{17}{20}$

### 연습문제 9

1. (c)
2. (b)
3. (c)
4. (a)
5. (d)
6. (a)
7. (c)
8. (a)
9. (b)
10. (a)
11. (c)
12. (b)
13. (d)
14. (b)
15. (d)

### 제3장

#### 연습문제 10

1.  $\frac{13}{20}$
2.  $\frac{9}{250}$
3.  $\frac{7}{40}$
4.  $\frac{6}{125}$
5. (a)  $\frac{33}{50}$  (b)  $\frac{21}{25}$  (c)  $\frac{1}{80}$  (d)  $\frac{141}{500}$  (e)  $\frac{3}{125}$
6.  $4\frac{21}{40}$
7.  $23\frac{11}{25}$
8.  $10\frac{3}{200}$
9.  $6\frac{7}{16}$
10. (a)  $1\frac{41}{50}$  (b)  $4\frac{11}{40}$  (c)  $14\frac{1}{8}$  (d)  $15\frac{7}{20}$  (e)  $16\frac{17}{80}$
11. 0.625
12. 6.6875
13. 0.21875
14. 11.1875
15. 0.28125

#### 연습문제 11

1. 14.18
2. 2.785
3. 65.38
4. 43.27
5. 1.297
6. 0.000528

#### 연습문제 12

1. 80.3
2. 329.3
3. 72.54
4. -124.83
5. 295.3
6. 18.3
7. 12.52mm

#### 연습문제 13

1. 4.998
2. 47.544
3. 385.02
4. 582.42
5. 456.9
6. 434.82
7. 626.1
8. 1591.6
9. 0.444
10. 0.62963
11. 1.563
12. 53.455
13. 13.84
14. 8.69
15. (a) 24.81 (b) 24.812
16. (a) 0.00639 (b) 0.0064
17. (a) 8.4 (b) 62.6
18. 2400
19. 89.25cm

#### 연습문제 14

1. (d)
2. (a)
3. (b)
4. (c)
5. (c)
6. (b)
7. (b)
8. (d)
9. (d)
10. (a)

## 제4장

### 연습문제 15

- |           |            |           |           |
|-----------|------------|-----------|-----------|
| 1. 30.797 | 2. 11927   | 3. 13.62  | 4. 53.832 |
| 5. 84.42  | 6. 1.0944  | 7. 50.330 | 8. 36.45  |
| 9. 10.59  | 10. 12.325 |           |           |

### 연습문제 16

- |           |                            |           |                           |
|-----------|----------------------------|-----------|---------------------------|
| 1. 12.25  | 2. 0.0361                  | 3. 46.923 | 4. $1.296 \times 10^{-3}$ |
| 5. 2.4430 | 6. 2.197                   | 7. 30.96  | 8. 0.0549                 |
| 9. 219.26 | 10. $5.832 \times 10^{-6}$ |           |                           |

### 연습문제 17

- |           |                            |                            |           |
|-----------|----------------------------|----------------------------|-----------|
| 1. 0.571  | 2. 40                      | 3. 0.13459                 | 4. 137.9  |
| 5. 14.96  | 6. 19.4481                 | 7. $515.36 \times 10^{-6}$ |           |
| 8. 1.0871 | 9. $15.625 \times 10^{-9}$ |                            | 10. 52.70 |

### 연습문제 18

- |                          |                              |                       |                         |
|--------------------------|------------------------------|-----------------------|-------------------------|
| 1. 2.182                 | 2. 11.122                    | 3. 185.82             | 4. 0.8307               |
| 5. 0.1581                | 6. 2.571                     | 7. 5.273              | 8. 1.2555               |
| 9. 0.30366               | 10. 1.068                    | 11. $3.5 \times 10^6$ | 12. $37.5 \times 10^3$  |
| 13. $4.2 \times 10^{-6}$ | 14. $202.767 \times 10^{-3}$ |                       | 15. $18.32 \times 10^6$ |

### 연습문제 19

- |                   |                    |                    |                   |
|-------------------|--------------------|--------------------|-------------------|
| 1. 0.4667         | 2. $\frac{13}{14}$ | 3. 4.458           | 4. 2.732          |
| 5. $\frac{1}{21}$ | 6. 0.7083          | 7. $-\frac{9}{10}$ | 8. $3\frac{1}{3}$ |
| 9. 2.567          | 10. 0.0776         |                    |                   |

### 연습문제 20

- |            |            |           |           |
|------------|------------|-----------|-----------|
| 1. 0.9205  | 2. 0.7314  | 3. 2.9042 | 4. 0.2719 |
| 5. 0.4424  | 6. 0.0321  | 7. 0.4232 | 8. 0.1502 |
| 9. -0.6992 | 10. 5.8452 |           |           |

### 연습문제 21

- |           |            |          |          |
|-----------|------------|----------|----------|
| 1. 4.995  | 2. 5.782   | 3. 25.72 | 4. 69.42 |
| 5. 0.6977 | 6. 52.92   | 7. 591.0 | 8. 17.90 |
| 9. 3.520  | 10. 0.3770 |          |          |

연습문제 22

- |                             |                            |                         |                        |
|-----------------------------|----------------------------|-------------------------|------------------------|
| 1. $A = 66.59 \text{ cm}^2$ | 2. $C = 52.78 \text{ mm}$  | 3. $R = 37.5$           | 4. $159 \text{ m/s}$   |
| 5. $0.407 \text{ A}$        | 6. $5.02 \text{ mm}$       | 7. $0.144 \text{ J}$    | 8. $628.8 \text{ m}^2$ |
| 9. $224.5$                  | 10. $14230 \text{ kg/m}^3$ | 11. $281.1 \text{ m/s}$ | 12. $2.526$            |

연습문제 23

- |                           |                                                                             |                         |                          |
|---------------------------|-----------------------------------------------------------------------------|-------------------------|--------------------------|
| 1. $589.27 \text{ g}$     | 2. $508.1 \text{ W}$                                                        | 3. $V = 2.61 \text{ V}$ | 4. $F = 854.5$           |
| 5. $I = 3.81 \text{ A}$   | 6. $t = 14.79 \text{ s}$                                                    | 7. $E = 3.96 \text{ J}$ | 8. $I = 12.77 \text{ A}$ |
| 9. $s = 17.25 \text{ m}$  | 10. $A = 7.184 \text{ cm}^2$                                                | 11. $v = 7.327$         |                          |
| 12. (a) $12.53 \text{ h}$ | (b) $1 \text{ h } 40 \text{ min, } 33 \text{ m}\cdot\text{p}\cdot\text{h.}$ | (c) $13.02 \text{ h}$   | (d) $13.15 \text{ h}$    |

연습문제 24

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (b) | 2. (d) | 3. (a) | 4. (c)  | 5. (b) | 6. (c) |
| 7. (b) | 8. (a) | 9. (d) | 10. (d) |        |        |

## 제5장

### 연습문제 25

1. 0.32%
2. 173.4%
3. 5.7%
4. 37.4%
5. 128.5%
6. 0.20
7. 0.0125
8. 68.75%
9. 38.462%
10. (a) 21.2% (b) 79.2% (c) 169%
11. (b), (d), (c), (a)
12.  $\frac{13}{20}$
13.  $\frac{5}{16}$
14.  $\frac{9}{16}$
15.  $A = \frac{1}{2}$ ,  $B = 50\%$ ,  $C = 0.25$ ,  $D = 25\%$ ,  $E = 0.30$ ,  
 $F = \frac{3}{10}$ ,  $G = 0.60$ ,  $H = 60\%$ ,  $I = 0.85$ ,  $J = \frac{17}{20}$

### 연습문제 26

1. 21.8 kg
2. 9.72 m
3. (a) 496.4 t (b) 8.657 g (c) 20.73 s
4. 2.25%
5. (a) 14% (b) 15.67% (c) 5.36%
6. 37.8 g
7. 14분 57초
8. 76 g
9. 611000 원
10. 37.49%
11. 39.2%
12. 17%
13. 38.7%
14. 2.7%
15. 5.60 m
16. 3.5%
17. (a) (i) 544  $\Omega$  (ii) 816  $\Omega$  (b) (i) 44.65 k $\Omega$  (ii) 49.35 k $\Omega$
18. 2592 rev/min
19. 126
20. 95.9238%

### 연습문제 27

1. 2.5%
2. 18%
3. £310
4. 175000 원
5. 260000 원
6. £20000
7. 8241.80만 원  
(= 82418000 원)
8. 5.025만 원  
(= 50250 원)
9. 39600 원
10. 917700 원
11. 1억 8500만 원
12. 7.2%
13. A 0.6 kg, B 0.9 kg, C 0.5 kg
14. 54%, 31%, 15%, 0.3 t
15. 20000 kg (또는 20 ton)
16. 13.5 mm, 11.5 mm
17. 600 kW

### 연습문제 28

1. (d)
2. (a)
3. (c)
4. (d)
5. (c)
6. (b)
7. (c)
8. (b)
9. (a)
10. (a)
11. (d)
12. (b)
13. (a)
14. (b)
15. (c)

## 제6장

### 연습문제 29

1.  $36:1$
2.  $3.5:1$  또는  $7:2$
3.  $47:3$
4. 96 cm, 240 cm
5.  $5\frac{1}{4}$  시간 또는 5시간 15분
6. 3680만 원, 1840만 원, 920만 원
7. 12 cm
8. 2172만 원
9.  $P:4개$   $Q:32개$
10. 3부분 : 12kg, 5부분 : 20kg, 6부분 : 24kg

### 연습문제 30

1.  $1:15$
2. 76 ml
3. 25%
4. 12.6 kg
5. 14.3 kg
6. 25000 kg

### 연습문제 31

1. 55600원
2. 660000원
3. 264 kg
4. 450 N
5. 14.56 kg
6. (a) 0.00025 (b) 48 MPa
7. (a) 440 K (b) 5.76 리터
8. 8960 볼트

### 연습문제 32

1. (a) 2 mA (b) 25 V
2. 434 fr
3. 685.8 mm
4. 83 lb 10 oz
5. (a) 159.1 리터 (b) 16.5 갤런
6. 29.4 MPa
7. 584.2 mm
8. \$1012

### 연습문제 33

1. 3.5 주
2. 20 일
3. (a) 9.18 (b) 6.12 (c) 0.3375
4. 50 분
5. (a)  $300 \times 10^3$  (b)  $0.375 \text{ m}^2$  (c)  $240 \times 10^3 \text{ Pa}$
6. (a) 32 J (b) 0.5 m

### 연습문제 34

1. (c)
2. (d)
3. (c)
4. (a)
5. (b)
6. (c)
7. (d)
8. (b)
9. (a)
10. (a)

## 제7장

### 연습문제 35

- |            |            |            |       |          |
|------------|------------|------------|-------|----------|
| 1. 27      | 2. 128     | 3. 100 000 | 4. 96 | 5. $2^4$ |
| 6. $\pm 5$ | 7. $\pm 8$ | 8. 100     | 9. 1  | 10. 64   |

### 연습문제 36

- |           |                          |           |                                        |      |
|-----------|--------------------------|-----------|----------------------------------------|------|
| 1. 128    | 2. $3^9$                 | 3. 16     | 4. $\frac{1}{9}$                       | 5. 1 |
| 6. 8      | 7. 100                   | 8. 1000   | 9. $\frac{1}{100}$ 또는 0.01             |      |
| 10. 5     | 11. $7^6$                | 12. $3^6$ | 13. $3^6$ 또는 729                       |      |
| 14. $3^4$ | 15. 1                    | 16. 25    | 17. $\frac{1}{3^5}$ 또는 $\frac{1}{243}$ |      |
| 18. 49    | 19. $\frac{1}{2}$ 또는 0.5 | 20. 1     |                                        |      |

### 연습문제 37

- |                             |                               |                      |                                  |                       |
|-----------------------------|-------------------------------|----------------------|----------------------------------|-----------------------|
| 1. $\frac{1}{3 \times 5^2}$ | 2. $\frac{1}{7^3 \times 3^7}$ | 3. $\frac{3^2}{2^5}$ | 4. $\frac{1}{2^{10} \times 5^2}$ | 5. 9                  |
| 6. 3                        | 7. $\frac{1}{2}$              | 8. $\pm \frac{2}{3}$ | 9. $\frac{147}{148}$             | 10. $-1\frac{19}{56}$ |
| 11. $-3\frac{13}{45}$       | 12. $\frac{1}{9}$             | 13. $-\frac{17}{18}$ | 14. 64                           | 15. $4\frac{1}{2}$    |

### 연습문제 38

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (d)  | 2. (b)  | 3. (a)  | 4. (c)  | 5. (c)  | 6. (a)  |
| 7. (d)  | 8. (b)  | 9. (c)  | 10. (c) | 11. (b) | 12. (b) |
| 13. (b) | 14. (a) | 15. (d) | 16. (b) | 17. (c) | 18. (a) |
| 19. (c) | 20. (d) | 21. (c) | 22. (a) | 23. (d) | 24. (a) |
| 25. (d) |         |         |         |         |         |



## 제8장

### 연습문제 39

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1. 세제곱미터, $\text{m}^3$          | 2. 패럿                          |
| 3. 제곱미터, $\text{m}^2$           | 4. 초당 미터, $\text{m/s}$         |
| 5. 세제곱미터당 킬로그램, $\text{kg/m}^3$ | 6. 주울                          |
| 7. 쿨롱                           | 8. 와트                          |
| 9. 라디안 또는 도                     | 10. 볼트                         |
| 11. 질량                          | 12. 전기저항                       |
| 13. 주파수                         | 14. 가속도                        |
| 15. 전기 전류                       | 16. 인덕턴스                       |
| 17. 길이                          | 18. 온도                         |
| 19. 압력                          | 20. 각속도                        |
| 21. $\times 10^9$               | 22. $\text{m}, \times 10^{-3}$ |
| 23. $\times 10^{-12}$           | 24. $\text{M}, \times 10^6$    |

### 연습문제 40

- (a)  $7.39 \times 10$  (b)  $2.84 \times 10$  (c)  $1.9762 \times 10^2$
- (a)  $2.748 \times 10^3$  (b)  $3.317 \times 10^4$  (c)  $2.74218 \times 10^5$
- (a)  $2.401 \times 10^{-1}$  (b)  $1.74 \times 10^{-2}$  (c)  $9.23 \times 10^{-3}$
- (a)  $1.7023 \times 10^3$  (b)  $1.004 \times 10$  (c)  $1.09 \times 10^{-2}$
- (a)  $5 \times 10^{-1}$  (b)  $1.1875 \times 10$  (c)  $3.125 \times 10^{-2}$  (d)  $1.306 \times 10^2$
- (a) 1010 (b) 932.7 (c) 54100 (d) 7
- (a) 0.0389 (b) 0.6741 (c) 0.008
- (a)  $1.35 \times 10^2$  (b)  $1.1 \times 10^5$
- (a)  $2 \times 10^2$  (b)  $1.5 \times 10^{-3}$
- (a)  $2.71 \times 10^3 \text{kgm}^{-3}$  (b)  $4.4 \times 10^{-1}$  (c)  $3.7673 \times 10^2 \Omega$  (d)  $5.11 \times 10^{-1} \text{MeV}$   
(e)  $9.57897 \times 10^7 \text{Ckg}^{-1}$  (f)  $2.241 \times 10^{-2} \text{m}^3 \text{mol}^{-1}$

### 연습문제 41

- |                           |                                            |                          |
|---------------------------|--------------------------------------------|--------------------------|
| 1. 60kPa                  | 2. 150 $\mu$ W 또는 0.15mW                   | 3. 50MV                  |
| 4. 55nF                   | 5. 100kW                                   | 6. 0.54mA 또는 540 $\mu$ A |
| 7. 1.5M                   | 8. 22.5mV                                  | 9. 35GHz                 |
| 11. 17 $\mu$ A            | 12. 46.2k $\Omega$                         | 10. 15pF                 |
| 15. 50kN                  | 16. 0.3nF                                  | 14. 2.025MHz             |
| 19. $13.5 \times 10^{-3}$ | 17. 62.50m                                 | 18. 0.0346kg             |
| 23. 5.6MPa                | 20. $4 \times 10^3$                        | 22. 0.053nm              |
| 26. 720g                  | 21. $3.8 \times 10^5 \text{km}$            | 25. 62.83kN              |
|                           | 24. $4.3 \times 10^{-3} \text{m}$ 또는 4.3mm |                          |
|                           | 27. 76.92MN                                |                          |

#### 연습문제 42

- |                         |                        |           |          |
|-------------------------|------------------------|-----------|----------|
| 1. 2450mm               | 2. 167.5cm             | 3. 658mm  | 4. 25.4m |
| 5. 56.32m               | 6. 4356mm              | 7. 87.5cm |          |
| 8. (a) 4650mm (b) 4.65m | 9. (a) 504cm (b) 5.04m |           |          |
| 10. 148.5mm과 151.5mm 사이 |                        |           |          |

#### 연습문제 43

- |                                  |                                                                           |                       |
|----------------------------------|---------------------------------------------------------------------------|-----------------------|
| 1. $8 \times 10^4 \text{cm}^2$   | 2. $240 \times 10^{-4} \text{m}^2$ 또는 $0.024 \text{m}^2$                  |                       |
| 3. $3.6 \times 10^6 \text{mm}^2$ | 4. $350 \times 10^{-6} \text{m}^2$ 또는 $0.35 \times 10^{-3} \text{m}^2$    | 5. $5000 \text{mm}^2$ |
| 6. $2.5 \text{cm}^2$             | 7. (a) $288000 \text{mm}^2$ (b) $2880 \text{cm}^2$ (c) $0.288 \text{m}^2$ |                       |

#### 연습문제 44

- |                                                                                               |                                                                        |                                                                    |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------|
| 1. $2.5 \times 10^6 \text{cm}^3$                                                              | 2. $400 \times 10^{-6} \text{m}^3$                                     | 3. $0.87 \times 10^9 \text{mm}^3$ 또는 $870 \times 10^6 \text{mm}^3$ |
| 4. $2.4 \text{m}^3$                                                                           | 5. $1500 \times 10^{-9} \text{m}^3$ 또는 $1.5 \times 10^{-6} \text{m}^3$ |                                                                    |
| 6. $400 \times 10^{-3} \text{cm}^3$ 또는 $0.4 \text{cm}^3$                                      | 7. $6.4 \times 10^3 \text{mm}^3$                                       |                                                                    |
| 8. $7500 \times 10^{-3} \text{cm}^3$ 또는 $7.5 \text{cm}^3$                                     |                                                                        |                                                                    |
| 9. (a) $0.18 \text{m}^3$ (b) $180000 \text{cm}^3$ 또는 $0.18 \times 10^6 \text{cm}^3$ (c) 180리터 |                                                                        |                                                                    |

#### 연습문제 45

- |                             |                          |                         |                         |
|-----------------------------|--------------------------|-------------------------|-------------------------|
| 1. 18.74in                  | 2. 82.28in               | 3. 37.95yd              | 4. 18.36mi              |
| 5. 41.66cm                  | 6. 1.98m                 | 7. 14.36m               | 8. 5.91km               |
| 9. (a) 22,745yd (b) 20.81km | 10. $9.688 \text{in}^2$  | 11. $18.18 \text{yd}^2$ |                         |
| 12. 30.89acre               | 13. $21.89 \text{mi}^2$  | 14. $41 \text{cm}^2$    | 15. $28.67 \text{m}^2$  |
| 16. $10117 \text{m}^2$      | 17. $55.17 \text{km}^2$  | 18. $12.24 \text{in}^3$ | 19. $7.572 \text{ft}^3$ |
| 20. $17.59 \text{yd}^3$     | 21. 31.7fluid pt         | 22. $35.23 \text{cm}^3$ | 23. $4.956 \text{m}^3$  |
| 24. 3.667l                  | 25. 47.32l               | 26. 34.59oz             | 27. 121.3lb             |
| 28. 4.409short ton          | 29. 220.6g               | 30. 1.630kg             |                         |
| 31. (a) 280lb (b) 127.2kg   | 32. $131^\circ \text{F}$ | 33. $75^\circ \text{C}$ |                         |

#### 연습문제 46

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (d)  | 2. (b)  | 3. (c)  | 4. (c)  | 5. (c)  | 6. (a)  |
| 7. (d)  | 8. (a)  | 9. (a)  | 10. (b) | 11. (c) | 12. (d) |
| 13. (c) | 14. (a) | 15. (d) | 16. (b) | 17. (d) | 18. (a) |
| 19. (b) | 20. (b) |         |         |         |         |

## 제9장

### 연습문제 47

- |             |               |                      |              |
|-------------|---------------|----------------------|--------------|
| 1. $-3a$    | 2. $a+2b+4c$  | 3. $3x-3x^2-3y-2y^2$ |              |
| 4. $6ab-3a$ | 5. $6x-5y+8z$ | 6. $1+2x$            | 7. $4x+2y+2$ |
| 8. $3a+5b$  | 9. $-2a-b+2c$ | 10. $3x^2-y^2$       |              |

### 연습문제 48

- |                    |                    |                             |                   |
|--------------------|--------------------|-----------------------------|-------------------|
| 1. $p^2q^3r$       | 2. $8a^2$          | 3. $6q^2$                   | 4. 46             |
| 5. $5\frac{1}{3}$  | 6. $-\frac{1}{2}$  | 7. 6                        | 8. $\frac{1}{7y}$ |
| 9. $5xz^2$         | 10. $3a^2+2ab-b^2$ | 11. $6a^2-13ab+3ac-5b^2+bc$ |                   |
| 12. $\frac{1}{3b}$ | 13. $2ab$          | 14. $3x$                    | 15. $2x-y$        |
| 16. $3p+2q$        | 17. $2a^2+2b^2$    |                             |                   |

### 연습문제 49

- |                                            |                                           |                                   |                                |
|--------------------------------------------|-------------------------------------------|-----------------------------------|--------------------------------|
| 1. $z^8$                                   | 2. $a^8$                                  | 3. $n^3$                          | 4. $b^{11}$                    |
| 5. $b^{-3}$                                | 6. $c^4$                                  | 7. $m^4$                          | 8. $x^{-3}$ 또는 $\frac{1}{x^3}$ |
| 9. $x^{12}$                                | 10. $y^{-6}$ 또는 $\frac{1}{y^6}$           | 11. $t^8$                         | 12. $c^{14}$                   |
| 13. $a^{-9}$ 또는 $\frac{1}{a^9}$            | 14. $b^{-12}$ 또는 $\frac{1}{b^{12}}$       | 15. $b^{10}$                      | 16. $s^{-9}$                   |
| 17. $p^6q^7r^5$                            | 18. $x^{-2}yz^{-2}$ 또는 $\frac{y}{x^2z^2}$ | 19. $x^5y^4z^3$ , $13\frac{1}{2}$ |                                |
| 20. $a^3b^{-2}c$ 또는 $\frac{a^3c}{b^2}$ , 9 |                                           |                                   |                                |

### 연습문제 50

- |                                                                                  |                                 |                                     |                      |
|----------------------------------------------------------------------------------|---------------------------------|-------------------------------------|----------------------|
| 1. $a^2b^{1/2}c^{-2}$ , $\pm 4\frac{1}{2}$                                       | 2. $\frac{1+a}{b}$              | 3. $ab^6c^{3/2}$                    | 4. $a^{-4}b^5c^{11}$ |
| 5. $\frac{p^2q}{q-p}$                                                            | 6. $xy^3\sqrt[6]{z^{13}}$       | 7. $\frac{1}{ef^2}$                 |                      |
| 8. $a^{11/6}b^{1/3}c^{-3/2}$ 또는 $\frac{\sqrt[6]{a^{11}}\sqrt[3]{b}}{\sqrt{c^3}}$ | 13. $a^{-9}$ 또는 $\frac{1}{a^9}$ | 14. $b^{-12}$ 또는 $\frac{1}{b^{12}}$ |                      |

### 연습문제 51

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (c)  | 2. (b)  | 3. (b)  | 4. (d)  | 5. (a)  | 6. (b)  |
| 7. (a)  | 8. (a)  | 9. (d)  | 10. (d) | 11. (c) | 12. (b) |
| 13. (b) | 14. (c) | 15. (c) |         |         |         |

## 제10장

### 연습문제 52

- |                         |                           |                       |                     |
|-------------------------|---------------------------|-----------------------|---------------------|
| 1. $x^2 + 5x + 6$       | 2. $2x^2 + 9x + 4$        | 3. $4x^2 + 12x + 9$   | 4. $2j^2 + 2j - 12$ |
| 5. $4x^2 + 22x + 30$    | 6. $2pqr + p^2q^2 + r^2$  | 7. $a^2 + 2ab + b^2$  | 8. $x^2 + 12x + 36$ |
| 9. $a^2 - 2ac + c^2$    | 10. $25x^2 + 30x + 9$     | 11. $4x^2 - 24x + 36$ | 12. $4x^2 - 9$      |
| 13. $64x^2 + 64x + 16$  | 14. $r^2s^2 + 2rst + t^2$ | 15. $3ab - 6a^2$      | 16. $2x^2 - 2xy$    |
| 17. $2a^2 - 3ab - 5b^2$ | 18. $13p - 7q$            | 19. $7x - y - 4z$     | 20. $4a^2 - 25b^2$  |
| 21. $x^2 - 4xy + 4y^2$  | 22. $9a^2 - 6ab + b^2$    | 23. 0                 | 24. $4 - a$         |
| 25. $4ab - 8a^2$        | 26. $3xy + 9x^2y - 15x^2$ | 27. $2 + 5b^2$        | 28. $11q - 2p$      |

### 연습문제 53

- |                               |                         |                                                                        |                      |
|-------------------------------|-------------------------|------------------------------------------------------------------------|----------------------|
| 1. $2(x + 2)$                 | 2. $2x(y - 4z)$         | 3. $p(b + 2c)$                                                         | 4. $2x(1 + 2y)$      |
| 5. $4d(d - 3f^5)$             | 6. $4x(1 + 2x)$         | 7. $2q(q + 4n)$                                                        | 8. $r(s + p + t)$    |
| 9. $x(1 + 3x + 5x^2)$         | 10. $bc(a + b^2)$       | 11. $3xy(xy^3 - 5y + 6)$                                               |                      |
| 12. $2pq^2(2p^2 - 5q)$        | 13. $7ab(3ab - 4)$      | 14. $2xy(y + 3x + 4x^2)$                                               |                      |
| 15. $2xy(x - 2y^2 + 4x^2y^3)$ |                         | 16. $7y(4 + y + 2x)$                                                   | 17. $\frac{3x}{y}$   |
| 18. 0                         | 19. $\frac{2r}{t}$      | 20. $(a + b)(y + 1)$                                                   | 21. $(p + q)(x + y)$ |
| 22. $(x - y)(a + b)$          | 23. $(a - 2b)(2x + 3y)$ | 24. $\frac{A^2}{pg} \left( \frac{A}{pg^2} - \frac{1}{g} + A^3 \right)$ |                      |

### 연습문제 54

- |                              |                 |                               |                              |
|------------------------------|-----------------|-------------------------------|------------------------------|
| 1. $2x + 8x^2$               | 2. $12y^2 - 3y$ | 3. $4b - 15b^2$               | 4. $4 + 3a$                  |
| 5. $\frac{3}{2} - 4x$        | 6. 1            | 7. $10y^2 - 3y + \frac{1}{4}$ | 8. $9x^2 + \frac{1}{3} - 4x$ |
| 9. $6a^2 + 5a - \frac{1}{7}$ | 10. $-15t$      | 11. $\frac{1}{5} - x - x^2$   | 12. $10a^2 - 3a + 2$         |

### 연습문제 55

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (a) | 2. (a) | 3. (b) | 4. (b)  | 5. (b) | 6. (d) |
| 7. (d) | 8. (c) | 9. (d) | 10. (c) |        |        |

## 제11장

### 연습문제 56

- |       |                  |         |       |       |         |
|-------|------------------|---------|-------|-------|---------|
| 1. 1  | 2. 2             | 3. 6    | 4. -4 | 5. 2  | 6. 1    |
| 7. 2  | 8. $\frac{1}{2}$ | 9. 0    | 10. 3 | 11. 2 | 12. -10 |
| 13. 6 | 14. -2           | 15. 2.5 | 16. 2 | 17. 6 | 18. -3  |

### 연습문제 57

- |       |                   |                    |                     |                    |             |
|-------|-------------------|--------------------|---------------------|--------------------|-------------|
| 1. 5  | 2. -2             | 3. $-4\frac{1}{2}$ | 4. 2                | 5. 12              | 6. 15       |
| 7. -4 | 8. $5\frac{1}{3}$ | 9. 2               | 10. 13              | 11. -10            | 12. 2       |
| 13. 3 | 14. -11           | 15. -6             | 16. 9               | 17. $6\frac{1}{4}$ | 18. 3       |
| 19. 4 | 20. 10            | 21. $\pm 12$       | 22. $-3\frac{1}{3}$ | 23. $\pm 3$        | 24. $\pm 4$ |

### 연습문제 58

- |                                      |                    |          |                                   |
|--------------------------------------|--------------------|----------|-----------------------------------|
| 1. $10^{-7}$                         | 2. $8\text{m/s}^2$ | 3. 3.472 | 4. (a) $1.8\Omega$ (b) $30\Omega$ |
| 5. 디지털 카메라 배터리 9000원, 캠코더 배터리 14000원 | 6. $800\Omega$     |          |                                   |
| 7. $30\text{m/s}^2$                  | 8. $176\text{MPa}$ |          |                                   |

### 연습문제 59

- |                            |                     |          |                       |
|----------------------------|---------------------|----------|-----------------------|
| 1. 12 cm, $240\text{cm}^2$ | 2. 0.004            | 3. 30    | 4. $45^\circ\text{C}$ |
| 5. 50                      | 6. 312000원, 240000원 | 7. 30 kg | 8. 12 m, 8 m          |
| 9. 3.5 N                   |                     |          |                       |

### 연습문제 60

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (c) | 2. (b) | 3. (a) | 4. (c)  | 5. (b) | 6. (a) |
| 7. (d) | 8. (c) | 9. (d) | 10. (a) |        |        |

## 제12장

### 연습문제 61

1.  $d = c - e - a - b$
2.  $x = \frac{y}{7}$
3.  $v = \frac{c}{p}$
4.  $a = \frac{v-u}{t}$
5.  $R = \frac{V}{I}$
6.  $y = \frac{1}{3}(t-x)$
7.  $r = \frac{c}{2\pi}$
8.  $x = \frac{y-c}{m}$
9.  $T = \frac{I}{PR}$
10.  $c = \frac{Q}{m\Delta T}$
11.  $L = \frac{X_L}{2\pi f}$
12.  $R = \frac{E}{I}$
13.  $x = a(y-3)$
14.  $C = \frac{5}{9}(F-32)$
15.  $f = \frac{1}{2\pi CX_C}$
16.  $R = \frac{pV}{mT}$

### 연습문제 62

1.  $r = \frac{S-a}{S}$  또는  $1 - \frac{a}{S}$
2.  $x = \frac{d}{\lambda}(y+\lambda)$  또는  $d + \frac{yd}{\lambda}$
3.  $f = \frac{3F-AL}{3}$  또는  $f = F - \frac{AL}{3}$
4.  $D = \frac{AB^2}{5Cy}$
5.  $t = \frac{R-R_0}{R_0\alpha}$
6.  $R_2 = \frac{RR_1}{R_1-R}$
7.  $R = \frac{E-e-Ir}{I}$  또는  $R = \frac{E-e}{I} - r$
8.  $V_2 = \frac{P_1V_1T_2}{P_2T_1}$
9.  $b = \sqrt{\left(\frac{y}{4ac^2}\right)}$
10.  $x = \frac{ay}{\sqrt{(y^2-b^2)}}$
11.  $L = \frac{gt^2}{4\pi^2}$
12.  $u = \sqrt{v^2-2as}$
13.  $R = \sqrt{\left(\frac{360A}{\pi\theta}\right)}$
14.  $T_2 = \frac{P_2V_2T_1}{P_1V_1}$
15.  $a = N^2y - x$
16.  $L = \frac{\sqrt{Z^2-R^2}}{2\pi f}, 0.080$
17.  $v = \sqrt{\frac{2L}{\rho ac}}$
18.  $V = \frac{k^2H^2L^2}{\theta^2}$
19.  $750 \times 10^9 \text{Hz} = 750 \text{GHz}$
20.  $x = \sqrt{\left(a^2 - \left(\frac{V}{W}\right)^2\right)}$

### 연습문제 63

1.  $a = \sqrt{\left(\frac{xy}{m-n}\right)}$
2.  $R = \sqrt[4]{\left(\frac{M}{\pi} + r^4\right)}$
3.  $r = \frac{3(x+y)}{(1-x-y)}$
4.  $L = \frac{mrCR}{\mu-m}$
5.  $b = \frac{c}{\sqrt{1-a^2}}$
6.  $r = \sqrt{\left(\frac{x-y}{x+y}\right)}$
7.  $b = \frac{a(p^2-q^2)}{2(p^2+q^2)}$
8.  $v = \frac{uf}{u-f}, 30$

$$9. \quad t_2 = t_1 + \frac{Q}{mc}, 55$$

$$11. \quad l = \frac{8S^2}{3d} + d, 2.725$$

$$13. \quad 64 \text{ mm}$$

$$15. \quad w = \frac{2R-F}{L}; 3 \text{ kN/m}$$

$$17. \quad r = \frac{v}{\omega} \left( \frac{1-s}{100} \right)$$

$$19. \quad r = \sqrt[4]{\left( \frac{8\eta \ell V}{\pi p} \right)}$$

$$21. \quad 500 \times 10^6 \text{ N/m}^2 = 500 \text{ MN/m}^2$$

$$10. \quad v = \sqrt{\left( \frac{2dgh}{0.03L} \right)}, 0.965$$

$$12. \quad C = \frac{1}{\omega \{ \omega L - \sqrt{Z^2 - R^2} \}}, 63.1 \times 10^{-6}$$

$$14. \quad \lambda = \sqrt[5]{\left( \frac{a\mu}{\rho CZ^4 n} \right)^2}$$

$$16. \quad t_2 = t_1 - \frac{Qd}{kA}$$

$$18. \quad F = EI \left( \frac{n\pi}{L} \right)^2; 13.61 \text{ MN}$$

$$20. \quad \ell = \sqrt[3]{\left( \frac{20gH^2}{I\rho^4 D^2} \right)^2}$$

$$22. \quad P = 37.0$$

#### 연습문제 64

1. (c)

2. (b)

3. (d)

4. (a)

5. (b)

6. (c)

7. (d)

8. (a)

9. (b)

10. (a)

11. (d)

12. (c)

13. (b)

14. (a)

15. (d)

## 제13장

### 연습문제 65

- |                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| 1. $x = 4, y = 2$      | 2. $x = 3, y = 4$   | 3. $x = 2, y = 1.5$ | 4. $x = 4, y = 1$   |
| 5. $p = 2, q = -1$     | 6. $x = 1, y = 2$   | 7. $x = 3, y = 2$   | 8. $a = 2, b = 3$   |
| 9. $a = 5, b = 2$      | 10. $x = 1, y = 1$  | 11. $s = 2, t = 3$  | 12. $x = 3, y = -2$ |
| 13. $m = 2.5, n = 0.5$ | 14. $a = 6, b = -1$ | 15. $x = 2, y = 5$  | 16. $c = 2, d = -3$ |

### 연습문제 66

- |                     |                    |                     |                         |
|---------------------|--------------------|---------------------|-------------------------|
| 1. $p = -1, q = -2$ | 2. $x = 4, y = 6$  | 3. $a = 2, b = 3$   | 4. $s = 4, t = -1$      |
| 5. $x = 3, y = 4$   | 6. $u = 12, v = 2$ | 7. $x = 10, y = 15$ | 8. $a = 0.30, b = 0.40$ |

### 연습문제 67

- |                                       |                                        |                                       |                    |
|---------------------------------------|----------------------------------------|---------------------------------------|--------------------|
| 1. $x = \frac{1}{2}, y = \frac{1}{4}$ | 2. $a = \frac{1}{3}, b = -\frac{1}{2}$ | 3. $p = \frac{1}{4}, q = \frac{1}{5}$ | 4. $x = 10, y = 5$ |
| 5. $c = 3, d = 4$                     | 6. $r = 3, s = \frac{1}{2}$            | 7. $x = 5, y = 1\frac{3}{4}$          | 8. 1               |

### 연습문제 68

- |                                              |                             |                                          |
|----------------------------------------------|-----------------------------|------------------------------------------|
| 1. $a = 0.2, b = 4$                          | 2. $I_1 = 6.47, I_2 = 4.62$ | 3. $u = 12, a = 4, v = 26$               |
| 4. £15500, £12800                            | 5. $m = -0.5, c = 3$        | 6. $\alpha = 0.00426, R_0 = 22.56\Omega$ |
| 7. $a = 15, b = 0.50$                        | 8. $a = 4, b = 10$          | 9. $F_1 = 1.5, F_2 = -4.5$               |
| 10. $R_1 = 5.7\text{kN}, R_2 = 6.3\text{kN}$ |                             | 11. $r = 0.258, \omega = 32.3$           |

### 연습문제 69

- |                                   |                                  |                                |
|-----------------------------------|----------------------------------|--------------------------------|
| 1. $x = 2, y = 1, z = 3$          | 2. $x = 2, y = -2, z = 2$        | 3. $x = 5, y = -1, z = -2$     |
| 4. $x = 4, y = 0, z = 3$          | 5. $x = 2, y = 4, z = 5$         | 6. $x = 1, y = 6, z = 7$       |
| 7. $x = 5, y = 4, z = 2$          | 8. $x = -4, y = 3, z = 2$        | 9. $x = 1.5, y = 2.5, z = 4.5$ |
| 10. $i_1 = -5, i_2 = -4, i_3 = 2$ | 11. $F_1 = 2, F_2 = -3, F_3 = 4$ |                                |

### 연습문제 70

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (c) | 2. (d) | 3. (c) | 4. (d)  | 5. (b) | 6. (a) |
| 7. (b) | 8. (a) | 9. (b) | 10. (a) |        |        |



## 제14장

### 연습문제 71

- |                                 |                                  |                        |                                |
|---------------------------------|----------------------------------|------------------------|--------------------------------|
| 1. 4, -4                        | 2. 4, -8                         | 3. 2, -6               | 4. -1.5, 1.5                   |
| 5. $0, -\frac{4}{3}$            | 6. 2, -2                         | 7. 4                   | 8. -5                          |
| 9. 1                            | 10. -2, -3                       | 11. -3, -7             | 12. 2, -1                      |
| 13. 4, -3                       | 14. 2, 7                         | 15. -4                 | 16. 2                          |
| 17. -3                          | 18. 3, -3                        | 19. $-2, -\frac{2}{3}$ | 20. -1.5                       |
| 21. $\frac{1}{8}, -\frac{1}{8}$ | 22. 4, -7                        | 23. -1, 1.5            | 24. $\frac{1}{2}, \frac{1}{3}$ |
| 25. $\frac{1}{2}, -\frac{4}{5}$ | 26. $1\frac{1}{3}, -\frac{1}{7}$ | 27. $\frac{3}{8}, -2$  | 28. $\frac{2}{5}, -3$          |
| 29. $\frac{4}{3}, -\frac{1}{2}$ | 30. $\frac{5}{4}, -\frac{3}{2}$  | 31. $x^2 - 4x + 3 = 0$ | 32. $x^2 + 3x - 10 = 0$        |
| 33. $x^2 + 5x + 4 = 0$          | 34. $4x^2 - 8x - 5 = 0$          | 35. $x^2 - 36 = 0$     | 36. $x^2 - 1.7x - 1.68 = 0$    |

### 연습문제 72

- |                   |                  |                  |                 |
|-------------------|------------------|------------------|-----------------|
| 1. -3.732, -0.268 | 2. -3.137, 0.637 | 3. 1.468, -1.135 | 4. 1.290, 0.310 |
| 5. 2.443, 0.307   | 6. -2.851, 0.351 |                  |                 |

### 연습문제 73

- |                  |                   |                  |                   |
|------------------|-------------------|------------------|-------------------|
| 1. 0.637, -3.137 | 2. 0.296, -0.792  | 3. 2.781, 0.719  | 4. 0.443, -1.693  |
| 5. 3.608, -1.108 | 6. 1.434, 0.232   | 7. 0.851, -2.351 | 8. 2.086, -0.086  |
| 9. 1.481, -1.081 | 10. 4.176, -1.676 | 11. 4, 2.167     | 12. 7.141, -3.641 |
| 13. 4.562, 0.438 |                   |                  |                   |

### 연습문제 74

- |                               |                       |               |
|-------------------------------|-----------------------|---------------|
| 1. 1.191 s                    | 2. 0.345 A, 0.905 A   | 3. 7.84 cm    |
| 4. 0.619 m, 19.38 m           | 5. 0.0133             | 6. 1.066 m    |
| 7. 86.78 cm                   | 8. 1.835 m, 18.165 m  | 9. 7 m        |
| 10. $12 \Omega$ , $28 \Omega$ | 11. 0.52 s 그리고 5.73 s | 12. 400 rad/s |
| 13. 2.602 m                   | 14. 1229 m, 238.9 m   | 15. 9.67      |

### 연습문제 75

- $x = 1, y = 3$  그리고  $x = -3, y = 7$
- $x = \frac{2}{5}, y = -\frac{1}{5}$  그리고  $x = -1\frac{2}{3}, y = -4\frac{1}{3}$
- $x = 0, y = 4$  그리고  $x = 3, y = 1$

연습문제 76

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (d)  | 2. (d)  | 3. (a)  | 4. (c)  | 5. (a)  | 6. (c)  |
| 7. (b)  | 8. (d)  | 9. (b)  | 10. (c) | 11. (b) | 12. (a) |
| 13. (a) | 14. (d) | 15. (c) |         |         |         |

## 제15장

### 연습문제 77

- |            |         |                    |                   |                    |           |
|------------|---------|--------------------|-------------------|--------------------|-----------|
| 1. 4       | 2. 4    | 3. 3               | 4. $-3$           | 5. $\frac{1}{3}$   | 6. 3      |
| 7. 2       | 8. $-2$ | 9. $1\frac{1}{2}$  | 10. $\frac{1}{3}$ | 11. 2              | 12. 10000 |
| 13. 100000 | 14. 9   | 15. $\frac{1}{32}$ | 16. 0.01          | 17. $\frac{1}{16}$ | 18. $e^3$ |

### 연습문제 78

- |                                           |                                          |              |                  |              |               |
|-------------------------------------------|------------------------------------------|--------------|------------------|--------------|---------------|
| 1. $\log 6$                               | 2. $\log 15$                             | 3. $\log 2$  | 4. $\log 3$      | 5. $\log 12$ | 6. $\log 500$ |
| 7. $\log 100$                             | 8. $\log 6$                              | 9. $\log 10$ | 10. $\log 1 = 0$ | 11. $\log 2$ |               |
| 12. $\log 243$ 또는 $\log 3^5$ 또는 $5\log 3$ | 13. $\log 16$ or $\log 2^4$ or $4\log 2$ |              |                  |              |               |
| 14. $\log 64$ or $\log 2^6$ or $6\log 2$  | 15. 0.5                                  | 16. 1.5      | 17. $x = 2.5$    |              |               |
| 18. $t = 8$                               | 19. $b = 2$                              | 20. $x = 2$  | 21. $a = 6$      | 22. $x = 5$  |               |

### 연습문제 79

- |          |          |              |          |                       |
|----------|----------|--------------|----------|-----------------------|
| 1. 1.690 | 2. 3.170 | 3. 0.2696    | 4. 6.058 | 5. 2.251              |
| 6. 3.959 | 7. 2.542 | 8. $-0.3272$ | 9. 316.2 | 10. $0.057\text{m}^3$ |

### 연습문제 80

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (c)  | 2. (c)  | 3. (d)  | 4. (b)  | 5. (a)  | 6. (b)  |
| 7. (c)  | 8. (b)  | 9. (d)  | 10. (c) | 11. (d) | 12. (d) |
| 13. (a) | 14. (a) | 15. (b) |         |         |         |

## 제16장

### 연습문제 81

- (a) 0.1653 (b) 0.4584 (c) 22030
- (a) 5.0988 (b) 0.064037 (c) 40.446
- (a) 4.55848 (b) 2.40444 (c) 8.05124
- (a) 48.04106 (b) 4.07482 (c)  $-0.08286$
- 2.739
- 120.7 m

### 연습문제 82

- 2.0601
- (a) 7.389 (b) 0.7408
- $1 - 2x^2 - \frac{8}{3}x^3 - 2x^4$
- $2x^{1/2} + 2x^{5/2} + x^{9/2} + \frac{1}{3}x^{13/2} + \frac{1}{12}x^{17/2} + \frac{1}{60}x^{21/2}$

### 연습문제 83

- 3.95, 2.05
- 1.65,  $-1.30$
- (a)  $28 \text{ cm}^3$  (b) 116 min
- (a)  $70^\circ \text{C}$  (b) 5 min

### 연습문제 84

- (a) 0.55547 (b) 0.91374 (c) 8.8941
- (a) 2.2293 (b)  $-0.33154$  (c) 0.13087
- $-0.4904$
- $-0.5822$
- 2.197
- 816.2
- 0.8274
- 11.02
- 1.522
- 1.485
- 1.962
- 3
- 4
- 147.9
- 4.901
- 3.095
- $t = e^{b+a \ln D} = e^b e^{a \ln D} = e^b e^{\ln D^a}$ , 즉  $t = e^b D^a$
- 500
- $W = PV \ln \left( \frac{U_2}{U_1} \right)$
- 992 m/s
- 348.5 Pa
- 25분

### 연습문제 85

- (a)  $150^\circ \text{C}$  (b)  $100.5^\circ \text{C}$
- 99.21 kPa
- (a) 29.32 V (b)  $71.31 \times 10^{-6} \text{ s}$
- (a) 1.993 m (b) 2.293 m
- (a)  $50^\circ \text{C}$  (b) 55.45 s
- 30.37 N
- (a) 3.04 A (b) 1.46 s
- $2.45 \text{ mol/cm}^3$
- (a) 7.07 A (b) 0.966 s
- 1732만 원
- (a) 100% (b) 67.03% (c) 1.83%
- 2.45 mA
- 142 ms
- 99.752%
- 20분 38초

연습문제 86

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (b) | 2. (b) | 3. (a) | 4. (c)  | 5. (c) | 6. (a) |
| 7. (b) | 8. (d) | 9. (d) | 10. (c) |        |        |

## 제17장

### 연습문제 87

- (a) 수평축:  $1\text{ cm} = 4\text{ V}$  (또는  $1\text{ cm} = 5\text{ V}$ ), 수직축:  $1\text{ cm} = 10\ \Omega$   
 (b) 수평축:  $1\text{ cm} = 5\text{ m}$ , 수직축:  $1\text{ cm} = 0.1\text{ V}$   
 (c) 수평축:  $1\text{ cm} = 10\text{ N}$ , 수직축:  $1\text{ cm} = 0.2\text{ mm}$
- (a)  $-1$  (b)  $-8$  (c)  $-1.5$  (d)  $4$       3.  $14.5$       4. (a)  $-1.1$  (b)  $-1.4$
- $1010\text{ rev/min}$ 은  $1070\text{ rev/min}$ 이 되어야 한다. ;  
 (a)  $1000\text{ rev/min}$  (b)  $167\text{ V}$

### 연습문제 88

- 표시되지 않은 값들:  $-0.75, 0.25, 0.75, 1.75, 2.25, 2.75$ ; 기울기  $= \frac{1}{2}$
- (a)  $4, -2$  (b)  $-1, 0$  (c)  $-3, -4$  (d)  $0, 4$
- (a)  $2, \frac{1}{2}$  (b)  $3, -2\frac{1}{2}$  (c)  $\frac{1}{24}, \frac{1}{2}$
- (a)  $6, -3$  (b)  $-2, 4$  (c)  $3, 0$  (d)  $0, 7$
- (a)  $2, -\frac{1}{2}$  (b)  $-\frac{2}{3}, -1\frac{2}{3}$  (c)  $\frac{1}{18}, 2$  (d)  $10, -4\frac{2}{3}$
- (a)  $\frac{3}{5}$  (b)  $-4$  (c)  $-1\frac{5}{6}$       7. (a)와 (c), (b)와 (e)
- (2, 1)      9. (1.5, 6)      10. (1, 2)
- (a)  $89\text{ cm}$  (b)  $11\text{ N}$  (c)  $2.4$  (d)  $l = 2.4W + 48$       12.  $P = 0.15W + 3.5$
- $a = -20, b = 412, N = -20t + 412$

### 연습문제 89

- (a)  $40^\circ\text{ C}$  (b)  $128\ \Omega$       2. (a)  $850\text{ rev/min}$  (b)  $77.5\text{ V}$
- (a)  $0.25$  (b)  $12$  (c)  $F = 0.25L + 12$  (d)  $89.5\text{ N}$  (e)  $592\text{ N}$  (f)  $212\text{ N}$
- $-0.003, 8.73\text{ N/cm}^2$       5. (a)  $22.5\text{ m/s}$  (b)  $6.5\text{ s}$  (c)  $v = 0.7t + 15.5$
- $m = 26.8L$       7. (a)  $1.25t$  (b)  $21.6\%$  (c)  $F = -0.095W + 2.2$
- (a)  $96 \times 10^9\text{ Pa}$  (b)  $0.00022$  (c)  $29 \times 10^6\text{ Pa}$
- (a)  $\frac{1}{5}$  (b)  $6$  (c)  $E = \frac{1}{5}L + 6$  (d)  $12\text{ N}$  (e)  $65\text{ N}$
- $a = 0.85, b = 12, 254.3\text{ kPa}, 275.5\text{ kPa}, 280\text{ K}$

### 연습문제 90

- (d)      2. (a)      3. (c)      4. (d)      5. (b)      6. (d)
- (b)      8. (a)      9. (c)      10. (c)      11. (d)      12. (b)
- (a)      14. (b)      15. (a)

## 제18장

### 연습문제 91

1. (a)  $y$  (b)  $x^2$  (c)  $c$  (d)  $d$
2. (a)  $y$  (b)  $\sqrt{x}$  (c)  $b$  (d)  $a$
3. (a)  $y$  (b)  $\frac{1}{x}$  (c)  $f$  (d)  $e$
4. (a)  $\frac{y}{x}$  (b)  $x$  (c)  $b$  (d)  $c$
5. (a)  $\frac{y}{x}$  (b)  $\frac{1}{x^2}$  (c)  $a$  (d)  $b$
6.  $a = 1.5$ ,  $b = 0.4$ ,  $11.78 \text{ mm}^2$
7.  $y = 2x^2 + 7$ ,  $5.15$
8. (a)  $950$ ,  $L = \frac{950}{d}$  (b)  $317 \text{ kN}$
9.  $a = 0.4$ ,  $b = 8.6$  (a)  $94.4$  (b)  $11.2$

### 연습문제 92

1. (a)  $\lg y$  (b)  $x$  (c)  $\lg a$  (d)  $\lg b$
2. (a)  $\lg y$  (b)  $\lg x$  (c)  $L$  (d)  $\lg k$
3. (a)  $\ln y$  (b)  $x$  (c)  $n$  (d)  $\ln m$
4.  $I = 0.0012 \text{ V}^2$ ,  $6.75$  칸델라
5.  $a = 3.0$ ,  $b = 0.5$
6.  $a = 5.6$ ,  $b = 2.6$ ,  $37.86$ ,  $3.0$
7.  $R_0 = 25.1$ ,  $c = 1.42$
8.  $y = 0.08e^{0.24x}$
9.  $T_0 = 35.3 \text{ N}$ ,  $\mu = 0.27$ ,  $64.8 \text{ N}$ ,  $1.29$  라디안

### 연습문제 93

1. (a)
2. (c)
3. (d)
4. (b)
5. (c)
6. (b)
7. (d)
8. (a)

## 제19장

### 연습문제 94

1.  $x = 2, y = 4$
2.  $x = 1, y = 1$
3.  $x = 3.5, y = 1.5$
4.  $x = -1, y = 2$
5.  $x = 2.3, y = -1.2$
6.  $x = -2, y = -3$
7.  $a = 0.4, b = 1.6$

### 연습문제 95

1. (a) 최소  $(0, 0)$  (b) 최소  $(0, -1)$  (c) 최대  $(0, 3)$  (d) 최대  $(0, -1)$
2.  $-0.4, 0.6$
3.  $-3.9, 6.9$
4.  $-1.1, 4.1$
5.  $-1.8, 2.2$
6.  $x = -1.5, -2, (-1.75, -0.1)$ 에서 최소
7.  $x = -0.7, 1.6$
8. (a)  $\pm 1.63$  (b)  $1, -0.3$
9.  $(-2.6, 13.2), (0.6, 0.8), x = -2.6, 0.6$
10.  $x = -1.2, 2.5$  (a)  $-30$  (b)  $2.75$ 와  $-1.50$  (c)  $2.3, -0.8$

### 연습문제 96

1.  $x = 4, y = 8$  그리고  $x = -0.5, y = -5.5$
2. (a)  $x = -1.5, 3.5$  (b)  $x = -1.24, 3.24$  (c)  $x = -1.5, 3.0$

### 연습문제 97

1.  $x = -2.0, -0.5, 1.5$
2.  $x = -2, 1, 3, (2.1, -4.1)$ 에서 최소,  $(-0.8, 8.2)$ 에서 최대
3.  $x = 1$
4.  $x = -2.0, 0.4, 2.6$
5.  $x = -1.2, 0.70, 2.5$
6.  $x = -2.3, 1.0, 1.8$
7.  $x = -1.5$

### 연습문제 98

1. (b)
2. (b)
3. (c)
4. (d)
5. (a)



## 제20장

### 연습문제 99

1.  $a = 12, n = 1.8, 451, 28.5$

2.  $k = 1.5, n = -13. m = 3, n = 2.5$

3.  $n = 2.5, m = 3$

### 연습문제 100

1. (i)  $a = -8, b = 5.3, p = -8(5.3)^q$  (ii)  $-224.7$  (iii)  $3.31$

### 연습문제 101

1.  $a = 76, k = -7 \times 10^{-5}, p = 76e^{-7 \times 10^{-5}h}, 37.74 \text{ kPa}$

2.  $\theta_0 = 152, k = -0.05$

### 연습문제 102

1. (c)

2. (a)

3. (d)

4. (a)

5. (c)

6. (d)

7. (b)

8. (b)

9. (d)

10. (b)

## 제21장

### 연습문제 103

- $82^{\circ} 27'$
- $27^{\circ} 54'$
- $51^{\circ} 11'$
- $100^{\circ} 6' 52''$
- $15^{\circ} 44' 17''$
- $86^{\circ} 49' 1''$
- $72.55^{\circ}$
- $27.754^{\circ}$
- $37^{\circ} 57'$
- $58^{\circ} 22' 52''$

### 연습문제 104

- 우각
- 둔각
- 예각
- 직각
- (a)  $21^{\circ}$  (b)  $62^{\circ} 23'$  (c)  $48^{\circ} 56' 17''$
- (a)  $102^{\circ}$  (b)  $165^{\circ}$  (c)  $10^{\circ} 18' 49''$
- (a)  $60^{\circ}$  (b)  $110^{\circ}$  (c)  $75^{\circ}$  (d)  $143^{\circ}$  (e)  $140^{\circ}$  (f)  $20^{\circ}$  (g)  $129.3^{\circ}$  (h)  $79^{\circ}$  (i)  $54^{\circ}$
- 횡단선
- (a) 13, 24, 57, 68
- (b) 1 & 2, 2 & 3, 3 & 4, 4 & 1, 5 & 6, 6 & 7, 7 & 8, 8 & 5, 3 & 8, 1 & 6, 4 & 7, 2 & 5
- (c) 1 & 5, 2 & 6, 4 & 8, 3 & 7 (d) 3 & 5, 2 & 8
- $59^{\circ} 20'$
- $a = 69^{\circ}, b = 21^{\circ}, c = 82^{\circ}$
- $51^{\circ}$
- 1.326rad
- 0.605rad
- $40^{\circ} 55'$

### 연습문제 105

- (a) 예각인 부등변인 예각삼각형 (b) 이등변삼각형 (c) 직각이등변삼각형  
(d) 부등변인 둔각삼각형 (e) 정삼각형 (f) 직각삼각형
- $a = 40^{\circ}, b = 82^{\circ}, c = 66^{\circ}, d = 75^{\circ}, e = 30^{\circ}, f = 75^{\circ}$
- $DF, DE$
- $52^{\circ}$
- $122.5^{\circ}$
- $\phi = 51^{\circ}, x = 161^{\circ}$
- $40^{\circ}, 70^{\circ}, 70^{\circ}, 125^{\circ}$ , 이등변삼각형
- $a = 18^{\circ} 50', b = 71^{\circ} 10', c = 68^{\circ}, d = 90^{\circ}, e = 22^{\circ}, f = 49^{\circ}, g = 41^{\circ}$
- $a = 103^{\circ}, b = 55^{\circ}, c = 77^{\circ}, d = 125^{\circ}, e = 55^{\circ}, f = 22^{\circ}, g = 103^{\circ},$   
 $h = 77^{\circ}, i = 103^{\circ}, j = 77^{\circ}, k = 81^{\circ}$
- $17^{\circ}$
- $A = 37^{\circ}, B = 60^{\circ}, E = 83^{\circ}$

### 연습문제 106

- (a) 합동삼각형  $BAC, DAC$ (SAS) (b) 합동삼각형  $FGE, JHI$ (SSS)  
(c) 합동이 아니다. (d) 합동삼각형  $QRT, SRT$ (RHS)  
(e) 합동삼각형  $UVW, XZY$ (ASA)
- 증명 문제

### 연습문제 107

- $x = 16.54\text{mm}, y = 4.18\text{mm}$
- 9cm, 7.79cm
- (a) 2.25cm (b) 4cm
- 3m

**연습문제 108**

1. 21.6절 [문제 30]에서 작도한 방법과 비슷하게 작도한다.
2. 21.6절 [문제 31]에서 작도한 방법과 비슷하게 작도한다.
3. 21.6절 [문제 32]에서 작도한 방법과 비슷하게 작도한다.
4. 21.6절 [문제 32]에서 작도한 방법과 비슷하게 작도한다.
5. 21.6절 [문제 3]에서 작도한 방법과 비슷하게 작도한다.

**연습문제 109**

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (a) | 2. (b) | 3. (b) | 4. (d)  | 5. (a) | 6. (c) |
| 7. (c) | 8. (b) | 9. (a) | 10. (d) |        |        |

## 제22장

### 연습문제 110

1. 9 cm
2. 24 m
3. 9.54 mm
4. 20.81 cm
5. 7.21 m
6. 11.18 cm
7. 24.11 mm
8.  $8^2 + 15^2 = 17^2$
9. (a) 각각 27.20 cm (b)  $45^\circ$
10. 20.81 km
11. 3.35 m, 10 cm
12. 132.7 해리
13. 2.94 mm
14. 24 mm

### 연습문제 111

1.  $\sin Z = \frac{9}{41}$ ,  $\cos Z = \frac{40}{41}$ ,  $\tan X = \frac{40}{9}$ ,  $\cos X = \frac{9}{41}$
2.  $\sin A = \frac{3}{5}$ ,  $\cos A = \frac{4}{5}$ ,  $\tan A = \frac{3}{4}$ ,  $\sin B = \frac{4}{5}$ ,  $\cos B = \frac{3}{5}$ ,  $\tan B = \frac{4}{3}$
3.  $\sin A = \frac{8}{17}$ ,  $\tan A = \frac{8}{15}$
4.  $\sin X = \frac{15}{113}$ ,  $\cos X = \frac{112}{113}$
5. (a)  $\frac{15}{17}$  (b)  $\frac{15}{17}$  (c)  $\frac{8}{15}$
6. (a)  $\sin \theta = \frac{7}{25}$  (b)  $\cos \theta = \frac{24}{25}$
7. (a) 9.434 (b)  $-0.625$

### 연습문제 112

1. 2.7550
2. 4.846
3. 36.52
4. (a) 0.8660 (b)  $-0.1010$  (c) 0.5865
5.  $42.33^\circ$
6.  $15.25^\circ$
7.  $73.78^\circ$
8.  $7^\circ 56'$
9.  $31^\circ 22'$
10.  $41^\circ 54'$
11.  $29.05^\circ$
12.  $20^\circ 21'$
13. 0.3586
14. 1.803
15. (a)  $40^\circ$  (b) 6.79 m
16.  $-68.37^\circ$

### 연습문제 113

1. (a) 12.22 (b) 5.619 (c) 14.87 (d) 8.349 (e) 5.595 (f) 5.275
2. (a)  $AC = 5.831$  cm,  $\angle A = 59.04^\circ$ ,  $\angle C = 30.96^\circ$   
(b)  $DE = 6.928$  cm,  $\angle D = 30^\circ$ ,  $\angle F = 60^\circ$   
(c)  $\angle J = 62^\circ$ ,  $HJ = 5.634$  cm,  $GH = 10.60$  cm  
(d)  $\angle L = 63^\circ$ ,  $LM = 6.810$  cm,  $KM = 13.37$  cm  
(e)  $\angle N = 26^\circ$ ,  $ON = 9.124$  cm,  $NP = 8.201$  cm  
(f)  $\angle S = 49^{curc}$ ,  $RS = 4.346$  cm,  $QS = 6.625$  cm
3. 6.54 m
4. 9.40 mm
5. 5.63 m

### 연습문제 114

1. 36.15 m
2. 48 m
3. 249.5 m
4. 110.1 m
5. 53.0 m
6. 9.50 m
7. 107.8 m
8. 9.43 m, 10.56 m
9. 60 m

연습문제 115

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (d)  | 2. (a)  | 3. (b)  | 4. (b)  | 5. (c)  | 6. (c)  |
| 7. (a)  | 8. (b)  | 9. (c)  | 10. (d) | 11. (d) | 12. (b) |
| 13. (c) | 14. (a) | 15. (d) |         |         |         |

## 제23장

### 연습문제 116

- (a)  $42.78^\circ$ ,  $137.22^\circ$  (b)  $188.53^\circ$ ,  $351.47^\circ$
- (a)  $29.08^\circ$ ,  $330.92^\circ$  (b)  $123.86^\circ$ ,  $236.14^\circ$
- (a)  $44.21^\circ$ ,  $224.21^\circ$  (b)  $113.12^\circ$ ,  $293.12^\circ$
- $t = 122^\circ 27'$ ,  $237^\circ 53'$
- $\alpha = 218^\circ 41'$ ,  $321^\circ 19'$
- $\theta = 39^\circ 44'$ ,  $219^\circ 44'$

### 연습문제 117

- 5
- $180^\circ$
- 30
- $120^\circ$
- 1,  $120^\circ$
- 2,  $144^\circ$
- 3,  $90^\circ$
- 5,  $720^\circ$
- 3.5,  $960^\circ$
- 6,  $360^\circ$
- 4,  $180^\circ$
- 5 ms
- 40 Hz
- $100\mu\text{s}$ , 0.1 ms
- 625 Hz
- 앞선다.
- 앞선다.

### 연습문제 118

- (a) 40 mA (b) 25 Hz (c) 0.04 s 또는 40 ms  
(d)  $40 \sin 50\pi t$ 에  $0.29 \text{ rad}$  (또는  $16.62^\circ$ ) 앞선다.
- (a) 75 cm (b) 6.37 Hz (c) 0.157 s  
(d)  $75 \sin 40t$ 에  $0.54 \text{ rad}$  (또는  $30.94^\circ$ ) 앞선다.
- (a) 300 V (b) 100 Hz (c) 0.01 s 또는 10 ms  
(d)  $300 \sin 200\pi t$ 에  $0.412 \text{ rad}$  (또는  $23.61^\circ$ ) 앞선다.
- (a)  $v = 120 \sin 100\pi t$  볼트 (b)  $v = 120 \sin(100\pi t + 0.43)$  볼트
- $i = 20 \sin\left(80\pi t - \frac{\pi}{6}\right) \text{ A}$  또는  $i = 20 \sin(80\pi t - 0.524) \text{ A}$
- $3.2 \sin(100\pi t + 0.488) \text{ m}$
- (a) 5 A, 50 Hz, 20 ms,  $24.75^\circ$  앞선다.  
(b)  $-2.093 \text{ A}$  (c)  $4.363 \text{ A}$  (d)  $6.375 \text{ ms}$  (e)  $3.423 \text{ ms}$

### 연습문제 119

- (b)
- (a)
- (a)
- (c)
- (d)

## 제24장

### 연습문제 120

1.  $C = 83^\circ$ ,  $a = 14.1\text{ mm}$ ,  $c = 28.9\text{ mm}$ , 넓이  $= 189\text{ mm}^2$
2.  $A = 52^\circ 2'$ ,  $c = 7.568\text{ cm}$ ,  $a = 7.152\text{ cm}$ , 넓이  $= 25.65\text{ cm}^2$
3.  $D = 19^\circ 48'$ ,  $E = 134^\circ 12'$ ,  $e = 36.0\text{ cm}$ , 넓이  $= 134\text{ cm}^2$
4.  $E = 49^\circ 0'$ ,  $F = 26^\circ 38'$ ,  $f = 15.09\text{ mm}$ , 넓이  $= 185.6\text{ mm}^2$
5.  $J = 44^\circ 29'$ ,  $L = 99^\circ 31'$ ,  $l = 5.420\text{ cm}$ , 넓이  $= 6.133\text{ cm}^2$  또는  
 $J = 135^\circ 31'$ ,  $L = 8^\circ 29'$ ,  $l = 0.811\text{ cm}$ , 넓이  $= 0.917\text{ cm}^2$
6.  $K = 47^\circ 8'$ ,  $J = 97^\circ 52'$ ,  $j = 62.2\text{ mm}$ , 넓이  $= 820.2\text{ mm}^2$  또는  
 $K = 132^\circ 52'$ ,  $J = 12^\circ 8'$ ,  $j = 13.19\text{ mm}$ , 넓이  $= 174.0\text{ mm}^2$

### 연습문제 121

1.  $p = 13.2\text{ cm}$ ,  $Q = 47.34^\circ$ ,  $R = 78.66^\circ$ , 넓이  $= 77.7\text{ cm}^2$
2.  $p = 6.127\text{ m}$ ,  $Q = 30.83^\circ$ ,  $R = 44.17^\circ$ , 넓이  $= 6.938\text{ m}^2$
3.  $X = 83.33^\circ$ ,  $Y = 52.62^\circ$ ,  $Z = 44.05^\circ$ , 넓이  $= 27.8\text{ cm}^2$
4.  $X = 29.77^\circ$ ,  $Y = 53.50^\circ$ ,  $Z = 96.73^\circ$ , 넓이  $= 355\text{ mm}^2$

### 연습문제 122

1.  $193\text{ km}$
2. (a)  $122.6\text{ m}$  (b)  $94.80^\circ$ ,  $40.66^\circ$ ,  $44.54^\circ$
3. (a)  $11.4\text{ m}$  (b)  $17.55^\circ$
4.  $163.4\text{ m}$
5.  $BF = 3.9\text{ m}$ ,  $EB = 4.0\text{ m}$
6.  $6.35\text{ m}$ ,  $5.37\text{ m}$
7.  $32.48\text{ A}$ ,  $14.31^\circ$

### 연습문제 123

1.  $80.42^\circ$ ,  $59.38^\circ$ ,  $40.20^\circ$
2. (a)  $15.23\text{ m}$  (b)  $38.07^\circ$
3.  $40.25\text{ cm}$ ,  $126.05^\circ$
4.  $19.8\text{ cm}$
5.  $36.2\text{ m}$
6.  $x = 69.3\text{ mm}$ ,  $y = 142\text{ mm}$
7.  $130^\circ$
8.  $13.66\text{ mm}$

### 연습문제 124

1. (d)
2. (d)
3. (a)
4. (a)
5. (c)
6. (c)
7. (b)
8. (c)
9. (a)
10. (b)

## 제25장

### 연습문제 125

1.  $(5.83, 59.04^\circ)$ ,  $(5.83, 1.03\text{rad})$
2.  $(6.61, 20.82^\circ)$ ,  $(6.61, 0.36\text{rad})$
3.  $(4.47, 116.57^\circ)$ ,  $(4.47, 2.03\text{rad})$
4.  $(6.55, 145.58^\circ)$ ,  $(6.55, 2.54\text{rad})$
5.  $(7.62, 203.20^\circ)$ ,  $(7.62, 3.55\text{rad})$
6.  $(4.33, 236.31^\circ)$ ,  $(4.33, 4.12\text{rad})$
7.  $(5.83, 329.04^\circ)$ ,  $(5.83, 5.74\text{rad})$
8.  $(15.68, 307.75^\circ)$ ,  $(15.68, 5.37\text{rad})$

### 연습문제 126

1.  $(1.294, 4.830)$
2.  $(1.917, 3.960)$
3.  $(-5.362, 4.500)$
4.  $(-2.884, 2.154)$
5.  $(-9.353, -5.400)$
6.  $(-2.615, -3.027)$
7.  $(0.750, -1.299)$
8.  $(4.252, -4.233)$
9. (a)  $40^\circ \angle 18^\circ$ ,  $40^\circ \angle 90^\circ$ ,  $40^\circ \angle 162^\circ$ ,  $40^\circ \angle 234^\circ$ ,  $40^\circ \angle 306^\circ$   
(b)  $(38.04, 12.36)$ ,  $(0, 40)$ ,  $(-38.04, 12.36)$ ,  $(-23.51, -32.36)$ ,  $(23.51, -32.36)$
10. 47.0mm

### 연습문제 127

1. (a)
2. (d)
3. (b)
4. (a)
5. (c)



## 제26장

### 연습문제 128

1.  $p = 105^\circ$ ,  $q = 35^\circ$     2.  $r = 142^\circ$ ,  $s = 95^\circ$     3.  $t = 146^\circ$

### 연습문제 129

1. (i) 마름모 (a)  $14\text{cm}^2$  (b)  $16\text{cm}$     (ii) 평행사변형 (a)  $180\text{mm}^2$  (b)  $80\text{mm}$   
(iii) 직사각형 (a)  $3600\text{mm}^2$  (b)  $300\text{mm}$     (iv) 사다리꼴 (a)  $190\text{cm}^2$  (b)  $62.91\text{cm}$   
2.  $35.7\text{cm}^2$     3. (a)  $80\text{m}$  (b)  $170\text{m}$     4.  $27.2\text{cm}^2$     5.  $18\text{cm}$   
6.  $1200\text{mm}$     7. (a)  $29\text{cm}^2$  (b)  $650\text{mm}^2$     8.  $560\text{m}^2$     9.  $3.4\text{cm}$   
10.  $6750\text{mm}^2$     11.  $43.30\text{cm}^2$     12. 32    13. 230, 400

### 연습문제 130

1.  $482\text{m}^2$     2. (a)  $50.27\text{cm}^2$  (b)  $706.9\text{mm}^2$  (c)  $3183\text{mm}^2$   
3.  $2513\text{mm}^2$     4. (a)  $20.19\text{mm}$  (b)  $63.41\text{mm}$     5. (a)  $53.01\text{cm}^2$  (b)  $129.9\text{mm}^2$   
6.  $5773\text{mm}^2$     7.  $1.89\text{m}^2$     8.  $0.196\text{m}^2$ ,  $1.785\text{m}$     9.  $586.9\text{cm}^2$

### 연습문제 131

1.  $1932\text{mm}^2$     2.  $1624\text{mm}^2$     3. (a)  $0.918\text{ha}$  (b)  $456\text{m}$   
4. 306    5.  $0.416\text{m}^2$

### 연습문제 132

1.  $80\text{ha}$     2.  $80\text{m}^2$     3.  $3.14\text{ha}$

### 연습문제 133

1. (b)    2. (a)    3. (b)    4. (d)    5. (b)    6. (c)  
7. (a)    8. (c)    9. (c)    10. (d)

## 제27장

### 연습문제 134

- |             |             |             |             |
|-------------|-------------|-------------|-------------|
| 1. 45.24 cm | 2. 259.5 mm | 3. 2.629 cm | 4. 47.68 cm |
| 5. 38.73 cm | 6. 12730 km | 7. 97.13 mm |             |

### 연습문제 135

- |                                                                   |                                                             |
|-------------------------------------------------------------------|-------------------------------------------------------------|
| 1. (a) $\frac{\pi}{6}$ (b) $\frac{5\pi}{12}$ (c) $\frac{5\pi}{4}$ | 2. (a) 0.838 (b) 1.481 (c) 4.054                            |
| 3. (a) $210^\circ$ (b) $80^\circ$ (c) $105^\circ$                 | 4. (a) $0^\circ 43'$ (b) $154^\circ 8'$ (c) $414^\circ 53'$ |
| 5. $104.7 \text{ rad/s}$                                          |                                                             |

### 연습문제 136

- |                                                     |                                                   |                                                    |                         |                        |
|-----------------------------------------------------|---------------------------------------------------|----------------------------------------------------|-------------------------|------------------------|
| 1. $113 \text{ cm}^2$                               | 2. $2376 \text{ mm}^2$                            | 3. $1790 \text{ mm}^2$                             | 4. $802 \text{ mm}^2$   | 5. $1709 \text{ mm}^2$ |
| 6. $1269 \text{ m}^2$                               | 7. $1548 \text{ m}^2$                             | 8. (a) $106.0 \text{ cm}$ (b) $783.9 \text{ cm}^2$ | 9. $21.46 \text{ m}^2$  |                        |
| 10. $17.80 \text{ cm}$ , $74.07 \text{ cm}^2$       | 11. (a) $59.86 \text{ mm}$ (b) $197.8 \text{ mm}$ | 12. $26.2 \text{ cm}$                              |                         |                        |
| 13. $202 \text{ mm}^2$                              | 14. $8.67 \text{ cm}$ , $54.48 \text{ cm}$        | 15. $82.5^\circ$                                   | 16. 748                 |                        |
| 17. (a) $0.698 \text{ rad}$ (b) $804.2 \text{ m}^2$ | 18. $10.47 \text{ m}^2$                           | 19. $19.63 \text{ m}^2$                            | 20. $2107 \text{ mm}^2$ |                        |
| 21. $2880 \text{ m}^2$                              | 22. $4.49 \text{ m}^2$                            | 23. $8.48 \text{ m}$                               | 24. $9.55 \text{ m}$    | 25. $60 \text{ mm}$    |
| 26. (a) $396 \text{ mm}^2$ (b) $42.24\%$            | 27. $701.8 \text{ mm}$                            | 28. $7.74 \text{ mm}$                              |                         |                        |

### 연습문제 137

- |                           |                           |
|---------------------------|---------------------------|
| 1. (a) 2 (b) $(3, -4)$    | 2. $(3, -2)$ 에서 중심, 반지름 4 |
| 3. 중심 $(0, 1)$ , 반지름 5인 원 | 4. 중심 $(0, 0)$ , 반지름 6인 원 |

### 연습문제 138

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (d) | 2. (b) | 3. (c) | 4. (c)  | 5. (c) | 6. (d) |
| 7. (a) | 8. (b) | 9. (a) | 10. (b) |        |        |

## 제28장

### 연습문제 139

1.  $1.2\text{m}^3$
2.  $5\text{cm}^3$
3.  $8\text{cm}^3$
4. (a)  $3840\text{mm}^3$  (b)  $1792\text{mm}^2$
5. 972L
6.  $15\text{cm}^3$ , 135g
7. 500L
8.  $1.44\text{m}^3$
9. (a)  $35.3\text{cm}^3$  (b)  $61.3\text{cm}^2$
10. (a)  $2400\text{cm}^3$  (b)  $2460\text{cm}^2$
11. 37.04m
12. 1.63cm
13.  $8796\text{cm}^3$
14. 4.709cm,  $153.9\text{cm}^2$
15. 2.99cm
16.  $28060\text{cm}^3$ ,  $1.099\text{m}^2$
17.  $8.22\text{m} \times 8.22\text{m}$
18. 62.5min
19. 4cm
20.  $4.08\text{m}^3$
21. (a)  $17.36\text{m}^2$  (b) 4778L
22. 272

### 연습문제 140

1.  $201.1\text{cm}^3$ ,  $159.0\text{cm}^2$
2.  $7.68\text{cm}^3$ ,  $25.81\text{cm}^2$
3.  $113.1\text{cm}^3$ ,  $113.1\text{cm}^2$
4. 5.131cm
5. 3cm
6.  $2681\text{mm}^3$
7. (a)  $268083\text{mm}^3$ ,  $268.083\text{cm}^3$  (b)  $20106\text{mm}^2$ ,  $201.06\text{cm}^2$
8. 8.53cm
9. (a)  $512 \times 10^6\text{km}^2$  (b)  $1.09 \times 10^{12}\text{km}^3$
10. 664
11.  $92\text{m}^3$ , 92,000L
12.  $8.48\text{m}^3$

### 연습문제 141

1.  $5890\text{mm}^2$ ,  $58.90\text{cm}^2$
2. (a)  $56.55\text{cm}^3$  (b)  $84.82\text{cm}^2$
3. 13.57kg
4.  $29.32\text{cm}^3$
5.  $393.4\text{m}^2$
6. (i) (a)  $670\text{cm}^3$  (b)  $523\text{cm}^2$  (ii) (a)  $180\text{cm}^3$  (b)  $154\text{cm}^2$   
(iii) (a)  $56.5\text{cm}^3$  (b)  $84.8\text{cm}^2$  (iv) (a)  $10.4\text{cm}^3$  (b)  $32.0\text{cm}^2$   
(v) (a)  $96.0\text{cm}^3$  (b)  $146\text{cm}^2$  (vi) (a)  $86.5\text{cm}^3$  (b)  $142\text{cm}^2$   
(vii) (a)  $805\text{cm}^3$  (b)  $539\text{cm}^2$
7. (a) 17.9cm (b) 38.0cm
8.  $125\text{cm}^3$
9.  $10.3\text{m}^3$ ,  $25.5\text{m}^2$
10. 6560L
11.  $657.1\text{cm}^3$ ,  $1027\text{cm}^2$
12.  $220.7\text{cm}^3$
13. (a) 1458L (b)  $9.77\text{m}^2$  (c) 1404500원
14.  $7.5\text{m}^3$
15. (a)  $66429\text{m}^2$  (b)  $202074\text{m}^3$
16. 31.13kg

### 연습문제 142

1.  $147\text{cm}^3$ ,  $164\text{cm}^2$
2.  $403\text{cm}^3$ ,  $337\text{cm}^2$
3.  $10480\text{m}^3$ ,  $1852\text{m}^2$
4.  $1707\text{cm}^2$
5. 10.69cm
6.  $55910\text{cm}^3$ ,  $6051\text{cm}^2$
7. 5.14m
8.  $0.07279\text{m}^3$

### 연습문제 143

1. 8 : 125
2. 137.2g

연습문제 144

- |        |        |        |         |        |        |
|--------|--------|--------|---------|--------|--------|
| 1. (d) | 2. (c) | 3. (a) | 4. (b)  | 5. (c) | 6. (a) |
| 7. (b) | 8. (c) | 9. (d) | 10. (a) |        |        |

## 제29장

### 연습문제 145

1. 4.5 단위 제공
2. 54.7 단위 제공
3. 63.33 m
4. 4.70 ha
5.  $143\text{m}^2$

### 연습문제 146

1.  $42.59\text{m}^3$
2.  $147\text{m}^3$
3.  $20.42\text{m}^3$

### 연습문제 147

1. (a) 2 A (b) 50 V (c) 2.5 A
2. (a) 2.5 mV (b) 3 A
3. 0.093 A s, 3.1 A
4. (a) 31.83 V (b) 0
5.  $49.13\text{cm}^2$ , 368.5 kPa

### 연습문제 148

1. (c)
2. (d)
3. (b)
4. (c)
5. (a)

## 제30장

### 연습문제 149

1. 스칼라량은 단지 크기만을 갖고, 벡터량은 크기와 방향을 모두 갖는다.
2. 스칼라                      3. 스칼라                      4. 벡터량                      5. 스칼라                      6. 스칼라
7. 벡터량                      8. 스칼라                      9. 벡터량

### 연습문제 150

1. 12N 힘에 관해  $18.00^\circ$  방향으로 17.35N
2. 12m/s 속도에 관해  $22.62^\circ$  방향으로 13m/s
3. 13N 힘에 관해  $37.57^\circ$  방향으로 16.40N
4. 18N 힘에 관해  $129.29^\circ$  방향으로 28.43N
5. 30m 변위에 관해  $21.80^\circ$  방향으로 32.31m
6. 5N 힘에 관해  $-14.72^\circ$  방향으로 14.72N
7. 수평방향에 관해  $29.04^\circ$  방향으로 29.15m/s
8.  $16.70^\circ$  방향으로 9.28N
9.  $159.56^\circ$  방향으로 6.89m/s
10. 10N 힘에 관해  $26.33^\circ$  방향으로 15.62N
11.  $E9.22^\circ S$  방향으로 21.07knots

### 연습문제 151

1. (a)  $78.16^\circ$  방향으로 54.0N                      (b)  $4.66^\circ$  방향으로 45.64N
2. (a)  $121.81^\circ$  방향으로 31.71m/s                      (b)  $8.63^\circ$  방향으로 19.55m/s

### 연습문제 152

1. 수직방향에 관해  $71.6^\circ$  방향으로 83.5km/h
2. 4분 55초,  $60^\circ$                       3. 22.79km/h,  $E9.78^\circ N$

### 연습문제 153

1.  $i - j - 4k$                       2.  $4i + j - 6k$                       3.  $-i + 7j - k$                       4.  $5i - 10k$
5.  $-3i + 27j - 8k$                       6.  $-5i + 10k$                       7.  $i + 7.5j - 4k$                       8.  $20.5j - 10k$
9.  $3.6i + 4.4j - 6.9k$                       10.  $2i + 40j - 43k$

### 연습문제 154

1. (c)                      2. (c)                      3. (a)                      4. (a)                      5. (d)                      6. (b)
7. (d)                      8. (a)                      9. (b)                      10. (c)

## 제31장

### 연습문제 155

1.  $4.5 \sin(A + 63.5^\circ)$
2. (a)  $20.9 \sin(\omega t + 0.63) \text{ V}$  (b)  $12.5 \sin(\omega t - 1.36) \text{ V}$
3.  $13 \sin(\omega t + 0.393) \text{ V}$

### 연습문제 156

1.  $4.5 \sin(A + 63.5^\circ)$
2. (a)  $20.9 \sin(\omega t + 0.62) \text{ V}$  (b)  $12.5 \sin(\omega t - 1.33) \text{ V}$
3.  $13 \sin(\omega t + 0.40)$

### 연습문제 157

1.  $4.472 \sin(\omega t + 63.44^\circ)$
2. (a)  $20.88 \sin(\omega t + 0.62) \text{ V}$  (b)  $12.50 \sin(\omega t - 1.33) \text{ V}$
3.  $13 \sin(\omega t + 0.395)$
4.  $11.11 \sin(\omega t + 0.324)$
5.  $8.73 \sin(\omega t - 0.173)$
6.  $1.01 \sin(\omega t - 0.698) \text{ A}$
7.  $85 \sin(\omega t + 0.490) \text{ mm}$

### 연습문제 158

1.  $11.11 \sin(\omega t + 0.324)$
2.  $8.73 \sin(\omega t - 0.173)$
3.  $i = 21.79 \sin(\omega t - 0.639)$
4.  $v = 5.695 \sin(\omega t + 0.695)$
5.  $x = 14.38 \sin(\omega t + 1.444)$
6. (a)  $305.3 \sin(314.2t - 0.233) \text{ V}$  (b)  $50 \text{ Hz}$
7. (a)  $10.21 \sin(628.3t + 0.818) \text{ V}$  (b)  $100 \text{ Hz}$  (c)  $10 \text{ ms}$
8. (a)  $79.83 \sin(300\pi t + 0.352) \text{ V}$  (b)  $150 \text{ Hz}$  (c)  $6.667 \text{ ms}$
9.  $150.6 \sin(\omega t - 0.247) \text{ V}$

### 연습문제 159

1. (b)
2. (d)
3. (c)
4. (b)
5. (a)

## 제32장

### 연습문제 160

1. (a) 연속 (b) 연속 (c) 이산 (d) 연속
2. (a) 이산 (b) 연속 (c) 이산 (d) 이산

### 연습문제 161

1. 하나의 기호가 10대의 자동차를 나타내는데 사용된다면, 5대 단위에서 보정하여 각각 3.5, 4.5, 6, 7, 5 그리고 4개의 기호로 나타낸다.
2. 하나의 기호가 100개의 부품을 나타내는데 사용된다면, 100개 단위에서 보정하여 월 8, 화 11, 수 9, 목 12, 금 6.5를 나타낸다.
3. 각각 길이가 35, 44, 62, 68, 49, 41에 비례하는 6개의 같은 간격인 수평 직사각형
4. 각각 길이가 1580, 2190, 1840, 2385, 1280 단위에 비례하는 5개의 같은 간격인 수평 직사각형
5. 각각 높이가 35, 44, 62, 68, 49, 41 단위에 비례하는 6개의 같은 간격인 수직 직사각형
6. 각각 높이가 1580, 2190, 1840, 2385, 1280 단위에 비례하는 5개의 같은 간격인 수직 직사각형.  $Q$ 와  $R$ 이 줄어든 반면에  $P$ 는 20% 증가한다.
8. 다음과 같이 분할된 동일한 높이의 사각형 네 개  
 1주: 18%, 7%, 35%, 12%, 28%;  
 2주: 20%, 8%, 32%, 13%, 27%;  
 3주: 22%, 10%, 29%, 14%, 25%;  
 4주: 20%, 9%, 27%, 19%, 25%.  
 $A$ 와  $B$ 는 중앙에서 약간 변화가 있고,  $C$ 는 약 8% 감소하고  $D$ 는 약 7% 증가 그리고  $E$ 는 약 3% 감소했다.
9. 각각 중심각이  $7.5^\circ$ ,  $22.5^\circ$ ,  $52.5^\circ$ ,  $167.5^\circ$ ,  $110^\circ$ 로 분할된 임의의 크기인 원
10. 각각 중심각이  $107^\circ$ ,  $156^\circ$ ,  $29^\circ$ ,  $68^\circ$ 로 분할된 임의의 크기인 원
11. (a) 495000원 (b) 88
12. (a) 16450000원 (b) 138

### 연습문제 162

1. 유일한 폴이는 없으며, 다음과 같은 도수분포를 만들 수 있다.

계급	도수
39.3 - 39.4	1
39.5 - 39.6	5
39.7 - 39.8	9
39.9 - 40.0	17
40.1 - 40.2	15
40.3 - 40.4	7
40.5 - 40.6	4
40.7 - 40.8	2



2. 중점이 39.35, 39.55, 39.75, 39.95, ... 이고 높이가 각각 1, 5, 9, 17, ... 인 서로 접하는 사각형들

3. 유일한 풀이는 없으며, 다음과 같은 도수분포를 만들 수 있다.

계급	도수
20.5 - 20.9	3
21.0 - 21.4	10
21.5 - 21.9	11
22.0 - 22.4	13
22.5 - 22.9	9
23.0 - 23.4	2

4. 유일한 풀이는 없으며, 다음과 같은 도수분포를 만들 수 있다.

계급	도수
1 - 10	3
11 - 19	7
20 - 22	12
23 - 25	11
26 - 28	10
29 - 38	5
39 - 48	2

5. 20.95 3; 21.45 13; 21.95 24; 22.45 37; 22.95 46; 23.45 48

6. 5.5, 15, 21, 24, 27, 33.5, 43.5를 중점으로 갖고 서로 접하는 직사각형. 직사각형의 높이(계급 범위당 도수)는 0.3, 0.78, 4, 4.67, 2.33, 0.5, 0.2이다.

7. (10.95 2), (11.45 9), (11.95 19), (12.45 31), (12.95 42), (13.45 50)

8. 문제 7의 답을 좌표로 가지는 위쪽 계급 경계에 대한 누적도수그래프

9. (a) 유일한 풀이는 없으며, 다음과 같은 도수분포를 만들 수 있다.

계급	도수
2.05 - 2.09	3
2.10 - 2.14	10
2.15 - 2.19	11
2.20 - 2.24	13
2.25 - 2.29	9
2.30 - 2.34	2

(b) 중점이 2.07, 2.12, ... 이고 높이가 3, 10, ... 인 서로 접하는 사각형들

(c) (a)의 풀이로 주어진 도수분포를 이용하여 다음을 얻는다.

2.095 3; 2.145 13; 2.195 24; 2.245 37; 2.295 46; 2.345 48

(d) (c)에 주어진 좌표를 가지는 위쪽 계급 경계에 대한 누적도수그래프

연습문제 163

1. (a)            2. (d)            3. (c)            4. (c)            5. (b)

### 제33장

#### 연습문제 164

1. 평균 7.33, 중위수 8, 최빈값 8
2. 평균 27.25, 중위수 27, 최빈값 26
3. 평균 4.7225, 중위수 4.72, 최빈값 4.72
4. 평균 115.2, 중위수 126.4, 최빈값이 없다.

#### 연습문제 165

1. 23.85 kg
2. 171.7 cm
3. 평균 89.5, 중위수 89, 최빈값 88.2
4. 평균 2.02158 cm, 중위수 2.02152 cm, 최빈값 2.02167 cm

#### 연습문제 166

1. 4.60
2.  $2.83\mu\text{F}$
3. 평균 34.53 MPa, 표준편차 0.07474 MPa
4. 0.296 kg
5. 9.394 cm
6. 0.00544 cm

#### 연습문제 167

1. 30, 27.5, 33.5 일
2. 27, 26, 33 결함
3.  $Q_1 = 164.5\text{ cm}$ ,  $Q_2 = 172.5\text{ cm}$ ,  $Q_3 = 179\text{ cm}$ , 7.25 cm
4. 37과 38; 40과 41
5. 40, 40, 41; 50, 51, 51

#### 연습문제 168

1. (d)
2. (a)
3. (b)
4. (c)
5. (d)
6. (b)
7. (b)
8. (c)
9. (a)
10. (d)

## 제34장

### 연습문제 169

1. (a)  $\frac{2}{9}$  또는 0.2222 (b)  $\frac{7}{9}$  또는 0.7778
2. (a)  $\frac{23}{139}$  또는 0.1655 (b)  $\frac{47}{139}$  또는 0.3381 (c)  $\frac{69}{139}$  또는 0.4964
3. (a)  $\frac{1}{6}$  (b)  $\frac{1}{6}$  (c)  $\frac{1}{36}$  4. 70% 5.  $\frac{5}{36}$
6. (a)  $\frac{2}{5}$  (b)  $\frac{1}{5}$  (c)  $\frac{4}{15}$  (d)  $\frac{13}{15}$
7. (a)  $\frac{1}{250}$  (b)  $\frac{1}{200}$  (c)  $\frac{9}{1000}$  (d)  $\frac{1}{50000}$

### 연습문제 170

1. (a) 0.6 (b) 0.2 (c) 0.15 2. (a) 0.64 (b) 0.32
3. 0.0768 4. (a) 0.4912 (b) 0.4211
5. (a) 89.38% (b) 10.25% 6. (a) 0.0227 (b) 0.0234 (c) 0.0169

### 연습문제 171

1. (c) 2. (d) 3. (c) 4. (b) 5. (b) 6. (d)
7. (a) 8. (a) 9. (b) 10. (c)

## 제35장

### 연습문제 172

1. 1, 5, 21, 9, 61                      2. 0, 11, -10, 21                      3. 증명 문제

### 연습문제 173

1. 16, 8

### 연습문제 174

1.  $28x^3$       2. 2      3.  $2x-1$       4.  $6x^2-5$       5.  $-\frac{1}{x^2}$   
 6. 0      7.  $1+\frac{2}{x^3}$       8.  $15x^4-8x^3+15x^2+2x$       9.  $-\frac{6}{x^4}$   
 10.  $4-8x$       11.  $\frac{1}{2\sqrt{x}}$       12.  $\frac{3}{2}\sqrt{t}$       13.  $-\frac{3}{x^4}$       14.  $3+\frac{1}{2\sqrt{x^3}}-\frac{1}{x^2}$   
 15.  $2x+2$       16.  $1+\frac{3}{2\sqrt{x}}$       17.  $2x-2$       18.  $-\frac{10}{x^3}+\frac{7}{2\sqrt{x^9}}$   
 19.  $6t-12$       20.  $1-\frac{4}{x^2}$       21. (a) 6 (b)  $\frac{1}{6}$  (c) 3 (d)  $-\frac{1}{16}$  (e)  $-\frac{1}{4}$  (f) -7  
 22.  $12x-3$  (a) -15 (b) 21      23.  $6x^2+6x-4$ , 32      24.  $-6x^2+4$ , -9.5

### 연습문제 175

1. (a)  $12\cos 3x$  (b)  $-12\sin 6x$       2.  $6\cos 3\theta+10\sin 2\theta$       3. -0.707  
 4. -3      5. 270.2 A/s      6. 1393.4 V/s  
 7.  $12\cos(4t+0.12)+6\sin(3t-0.72)$

### 연습문제 176

1. (a)  $15e^{3x}$  (b)  $-\frac{4}{7e^{2x}}$       2.  $\frac{5}{\theta}-\frac{4}{\theta}=\frac{1}{\theta}$       3. 16      4. 2.80  
 5. 664

### 연습문제 177

1. (a) -1 (b) 16      2.  $-\frac{4}{x^3}+\frac{2}{x}+10\sin 5x-12\cos 2x+\frac{6}{e^{3x}}$

### 연습문제 178

1. (a)  $36x^2 + 12x$  (b)  $72x + 12$
2.  $8 + \frac{2}{x^3}$
3. (a)  $\frac{4}{5} - \frac{12}{t^5} + \frac{6}{t^3} + \frac{1}{4\sqrt{t^3}}$  (b)  $-4.95$
4.  $-12\sin 2t - \cos t$
5.  $-\frac{2}{\theta^2}$

### 연습문제 179

1.  $-2542 \text{ A/s}$
2. (a)  $0.16 \text{ cd/V}$  (b)  $312.5 \text{ V}$
3. (a)  $-1000 \text{ V/s}$  (b)  $-367.9 \text{ V/s}$
4.  $-1.635 \text{ Pa/m}$
5.  $1.947 \text{ m/s}$

### 연습문제 180

1.  $x \cos x + \sin x$
2.  $-3x^2 \sin 3x + 2x \cos 3x$  또는  $x(2 \cos 3x - 3x \sin 3x)$
3.  $4(1 + \ln 3x)$
4.  $e^{3t}(4 \cos 4t + 3 \sin 4t)$
5.  $e^{4\theta}(\frac{1}{\theta} + 4 \ln 3\theta)$
6.  $3.947$
7.  $1.256$

### 연습문제 181

1.  $\frac{x \cos x - \sin x}{x^2}$
2.  $-\frac{6}{x^4}(x \sin 3x + \cos 3x)$
3.  $\frac{3(1-x^2)}{(x^2+1)^2}$
4.  $\frac{2(1-\ln 2x)}{4x^2}$
5.  $\frac{e^x}{\cos^2 x}(x \cos x + \cos x + x \sin x)$
6.  $-18$
7.  $-1.99$

### 연습문제 182

1.  $8(2x-1)^3$
2.  $5(2x^3-5x)^4(6x^2-5)$
3.  $-20 \sin(4x+3)$
4.  $6 \cos(3\theta-2)$
5.  $-10 \cos^4 x \sin x$
6.  $\frac{5(2-3x^2)}{(x^3-2x+1)^6}$
7.  $12e^{3t+1}$
8.  $1.86$

### 연습문제 183

1. (b)
2. (d)
3. (b)
4. (c)
5. (c)
6. (a)
7. (b)
8. (a)
9. (d)
10. (c)
11. (a)
12. (c)
13. (d)
14. (a)
15. (b)

## 제36장

### 연습문제 184

1. (a)  $4x + c$  (b)  $\frac{7x^2}{2} + c$
2. (a)  $\frac{5}{4}x^4 + c$  (b)  $\frac{3}{8}t^8 + c$
3. (a)  $\frac{2}{15}x^3 + c$  (b)  $\frac{5}{24}x^4 + c$
4. (a)  $\frac{2}{5}x^5 - \frac{3}{2}x^2 + c$  (b)  $2t - \frac{3}{4}t^4 + c$
5. (a)  $\frac{3x^2}{2} - 5x + c$  (b)  $4\theta + 2\theta^2 + \frac{\theta^3}{3} + c$
6. (a)  $\frac{5}{2}\theta^2 - 2\theta + \theta^3 + c$  (b)  $\frac{3}{4}x^4 - \frac{2}{3}x^3 + \frac{3}{2}x^2 - 2x + c$
7. (a)  $-\frac{4}{3x} + c$  (b)  $-\frac{1}{4x^3} + c$
8. (a)  $\frac{4}{5}\sqrt{x^5} + c$  (b)  $\frac{1}{9}\sqrt[4]{x^9} + c$
9. (a)  $\frac{10}{\sqrt{t}} + c$  (b)  $\frac{15}{7}\sqrt[5]{x} + c$
10. (a)  $\frac{3}{2}\sin 2x + c$  (b)  $-\frac{7}{3}\cos 3\theta + c$
11. (a)  $-6\cos \frac{1}{2}x + c$  (b)  $18\sin \frac{1}{3}x + c$
12. (a)  $\frac{3}{8}e^{2x} + c$  (b)  $-\frac{2}{15e^{5x}} + c$
13. (a)  $\frac{2}{3}\ln x + c$  (b)  $\frac{u^2}{2} - \ln u + c$
14. (a)  $8\sqrt{x} + 8\sqrt{x^3} + \frac{18}{5}\sqrt{x^5} + c$  (b)  $-\frac{1}{t} + 4t + \frac{4t^3}{3} + c$

### 연습문제 185

1. (a) 1.5 (b) 0.5
2. (a) 105 (b) -0.5
3. (a) 6 (b) -1.333
4. (a) -0.75 (b) 0.8333
5. (a) 10.67 (b) 0.1667
6. (a) 0 (b) 4
7. (a) 1 (b) 4.248
8. (a) 0.2352 (b) 2.638
9. (a) 19.09 (b) 2.457
10. (a) 0.2703 (b) 9.099
11. 77.7m<sup>3</sup>

### 연습문제 186

1. 증명 문제
2. 증명 문제
3. 32
4. 29.33Nm
5. 37.5
6. 7.5
7. 1
8. 1.67
9. 2.67
10. 140m

### 연습문제 187

1. (d)
2. (a)
3. (b)
4. (a)
5. (c)
6. (a)
7. (b)
8. (d)
9. (d)
10. (c)
11. (b)
12. (b)
13. (d)
14. (c)
15. (c)

## 제37장

### 연습문제 188

1. 21, 25
2. 48, 96
3. 14, 7
4. -3, -8
5. 50, 65
6. 0.001, 0.0001
7. 54, 79

### 연습문제 189

1. 1, 3, 5, 7, ...
2. 7, 10, 13, 16, 19, ...
3. 6, 11, 16, 21, ...
4.  $5n$
5.  $6n-2$
6.  $2n+1$
7.  $4n-2$
8.  $3n+6$
9.  $6^3 (= 216)$ ,  $7^3 (= 343)$

### 연습문제 190

1. 68
2. 6.2
3. 85.25
4. 23.5
5. 11번째
6. 209
7. 346.5

### 연습문제 191

1. -0.5
2. 1.5, 3, 4.5
3. 7808
4. 25
5. 8.5, 12, 15.5, 19
6. (a) 120 (b) 26070 (c) 250.5
7. 1984만 원, 22368만 원
8. 8720만 원

### 연습문제 192

1. 2560
2. 273.25
3. 512, 4096
4. 812.5
5. 8
6.  $1\frac{2}{3}$

### 연습문제 193

1. (a) 3 (b) 2 (c) 59022
2. 10번째
3. 1566만 원, 11년
4. 56.68M
5. 71.53g
6. (a) 5991400원 (b) 19년
7. 100, 139, 193, 268, 373, 518, 720, 1000rev/min

### 연습문제 194

1. (d)
2. (a)
3. (b)
4. (b)
5. (d)
6. (c)
7. (d)
8. (b)
9. (c)
10. (a)



## 제38장

### 연습문제 195

1. (a)  $6_{10}$  (b)  $11_{10}$  (c)  $14_{10}$  (d)  $9_{10}$
2. (a)  $21_{10}$  (b)  $25_{10}$  (c)  $45_{10}$  (d)  $51_{10}$
3. (a)  $42_{10}$  (b)  $56_{10}$  (c)  $65_{10}$  (d)  $184_{10}$
4. (a)  $0.8125_{10}$  (b)  $0.78125_{10}$  (c)  $0.21875_{10}$  (d)  $0.34375_{10}$
5. (a)  $26.75_{10}$  (b)  $23.375_{10}$  (c)  $53.4375_{10}$  (d)  $213.71875_{10}$

### 연습문제 196

1. (a)  $101_2$  (b)  $1111_2$  (c)  $10011_2$  (d)  $11101_2$
2. (a)  $11111_2$  (b)  $101010_2$  (c)  $111001_2$  (d)  $111111_2$
3. (a)  $101111_2$  (b)  $111100_2$  (c)  $1001001_2$  (d)  $1010100_2$
4. (a)  $0.01_2$  (b)  $0.00111_2$  (c)  $0.01001_2$  (d)  $0.10011_2$
5. (a)  $101111.01101_2$  (b)  $11110.1101_2$  (c)  $110101.11101_2$  (d)  $111101.10101_2$

### 연습문제 197

- |            |              |               |               |
|------------|--------------|---------------|---------------|
| 1. 101     | 2. 1011      | 3. 10100      | 4. 101100     |
| 5. 1001000 | 6. 100001010 | 7. 1010110111 | 8. 1001111101 |
| 9. 111100  | 10. 110111   | 11. 110011    | 12. 1101110   |

### 연습문제 198

1. (a)  $101010111_2$  (b)  $1000111100_2$  (c)  $10011110001_2$
2. (a)  $0.01111_2$  (b)  $0.1011_2$  (c)  $0.10111_2$
3. (a)  $11110111.00011_2$  (b)  $1000000010.0111_2$  (c)  $11010110100.11001_2$
4. (a)  $7.4375_{10}$  (b)  $41.25_{10}$  (c)  $7386.1875_{10}$

### 연습문제 199

- |               |              |               |               |              |
|---------------|--------------|---------------|---------------|--------------|
| 1. $231_{10}$ | 2. $44_{10}$ | 3. $152_{10}$ | 4. $753_{10}$ | 5. $36_{16}$ |
| 6. $C8_{16}$  | 7. $5B_{16}$ | 8. $EE_{16}$  |               |              |

### 연습문제 200

- |               |                 |                 |                     |
|---------------|-----------------|-----------------|---------------------|
| 1. $D7_{16}$  | 2. $EA_{16}$    | 3. $8B_{16}$    | 4. $A5_{16}$        |
| 5. $110111_2$ | 6. $11101101_2$ | 7. $10011111_2$ | 8. $101000100001_2$ |

연습문제 201

- |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|
| 1. (c)  | 2. (b)  | 3. (d)  | 4. (c)  | 5. (b)  | 6. (c)  |
| 7. (d)  | 8. (c)  | 9. (d)  | 10. (a) | 11. (c) | 12. (a) |
| 13. (d) | 14. (b) | 15. (c) | 16. (c) | 17. (a) | 18. (a) |
| 19. (a) | 20. (b) | 21. (a) | 22. (b) | 23. (c) | 24. (b) |
| 25. (d) |         |         |         |         |         |

## 제39장

### 연습문제 202

1. (a)  $t > 2$  (b)  $x < 5$
2. (a)  $x > 3$  (b)  $x \geq 3$
3. (a)  $t \leq 1$  (b)  $x \leq 6$
4. (a)  $k \geq \frac{3}{2}$  (b)  $z > \frac{1}{2}$
5. (a)  $y \geq -\frac{4}{3}$  (b)  $x \geq -\frac{1}{2}$

### 연습문제 203

1.  $-5 < t < 3$
2.  $-5 \leq y \leq -1$
3.  $-\frac{3}{2} < x < \frac{5}{2}$
4.  $t > 3$ 과  $t < \frac{1}{3}$
5.  $k \geq 4$ 과  $k \leq -2$

### 연습문제 204

1.  $-4 \leq x \leq 3$
2.  $t > 5, t < -9$
3.  $-5 < z \leq 14$
4.  $-3 < x \leq -2$

### 연습문제 205

1.  $z > 4, z < -4$
2.  $-4 < z < 4$
3.  $x \geq \sqrt{3}, rx \leq -\sqrt{3}$
4.  $-2 \leq k \leq 2$
5.  $-5 \leq t \leq 7$
6.  $t \geq 7, t \leq -5$
7.  $y \geq 2, y \leq -2$
8.  $k > -\frac{1}{2}, k < -2$

### 연습문제 206

1.  $x > 3, x < -2$
2.  $-4 \leq t \leq 2$
3.  $-2 < x < \frac{1}{2}$
4.  $y \geq 5, y \leq -4$
5.  $-4 \leq z \leq 0$
6.  $(-\sqrt{3}-3) \leq x \leq (\sqrt{3}-3)$
7.  $t \geq (\sqrt{11}+2), t \leq (2-\sqrt{11})$
8.  $k \geq \left(\sqrt{\frac{13}{4}} + \frac{1}{2}\right), k \leq \left(-\sqrt{\frac{13}{4}} + \frac{1}{2}\right)$