연습문제 답안

제1장

연습문제 1 (17쪽)

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

연습문제 2 (19쪽)

1. (a) 468 (b) 868
2. (a) 1827원 (b) 4158원
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. 89.25 cm
12. 29

연습문제 3 (20쪽)

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 (21쪽)

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

제2장

연습문제 5 (25쪽)

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. $\frac{17}{20}$

연습문제 6 (27쪽)

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 7 (28쪽)

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. $2\frac{17}{20}$

제3장

연습문제 8 (30쪽)

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 9 (31쪽)

1. 14.18 2. 2.785 3. 65.38 4. 43.27

5. 1.297 6. 0.000528

연습문제 10 (32쪽)

1. 80.3 2. 329.3 3. 72.54 4. -124.83

5. 295.3 6. 18.3 7. 12.52 mm

연습문제 11 (34쪽)

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) $8.\dot{4}$ (b) $62.\dot{6}$

18. 2400

제4장

연습문제 12 (36쪽)

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 13 (37쪽)

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

연습문제 14 (38쪽)

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

연습문제 15 (39쪽)

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. 3.5×10^{6}	12. 37.5×10^{3}
13. 4.2×10^{-6}	14. 202.767×10^{-3}		15. 18.32×10^{6}

연습문제 16 (40쪽)

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 17 (41쪽)

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 18 (41쪽)

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 19 (42쪽)

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

연습문제 20 (44쪽)

1. $589.27\mathrm{g}$	2. $508.1\,\mathrm{W}$	3. $V = 2.61\,\mathrm{V}$	4. $F = 854.5$
5. $I = 3.81\,\mathrm{A}$	6. $t = 14.79\,\mathrm{s}$	7. $E = 3.96\,\mathrm{J}$	8. $I = 12.77\,\mathrm{A}$
9. $s = 17.25\,\mathrm{m}$	10. $A = 7.184\,\mathrm{cm}^2$	11. $v = 7.327$	

12. (a) $12.53\,\mathrm{h}$ (b) $1\,\mathrm{h}\ 40\,\mathrm{min}$, $33\,\mathrm{m\cdot p\cdot h}$. (c) $13.02\,\mathrm{h}$ (d) $13.15\,\mathrm{h}$

제5장

연습문제 21 (49쪽)

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. $A=\frac{1}{2}$, $B=50\%$, $C=0.25$, $D=25\%$, $E=0.30$,

    $F=\frac{3}{10}$, $G=0.60$, $H=60\%$, $I=0.85$, $J=\frac{17}{20}$
16. 779Ω에서 861Ω까지

연습문제 22 (51쪽)

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. 611000원
10. 37.49%
11. 39.2%
12. 17%
13. 38.7%
14. 2.7%
15. 5.60 m
16. 3.5%
17. (a) (i) 544Ω (ii) 816Ω (b) (i) 44.65 kΩ (ii) 49.35 kΩ
18. 2592 rev/min

연습문제 23 (53쪽)

1. 2.5%
2. 18%
3. £310
4. 175000원
5. 260000원
6. £20000
7. 8778.05만 원 (= 87780500원)
8. 5.025만 원 (= 50250원)
9. 39600원
10. 917700원
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

제6장

연습문제 24 (57쪽)

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

연습문제 25 (58쪽)

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

연습문제 26 (59쪽)

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) 5.76리터
8. 8960볼트

연습문제 27 (61쪽)

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

연습문제 28 (62쪽)

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

제7장

연습문제 29 (64쪽)

1. 27	2. 128	3. 100000	4. 96	5. 2^4
6. ± 5	7. ± 8	8. 100	9. 1	10. 64

연습문제 30 (66쪽)

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 31 (68쪽)

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. $4\frac{1}{2}$

제8장

연습문제 32 (72쪽)

1. 세제곱미터, m^3
2. 패럿
3. 제곱미터, m^2
4. 초당 미터, m/s
5. 세제곱미터당 킬로그램, 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. 인턱턴스
17. 길이
18. 온도
19. 압력
20. 각속도
21. $\times 10^9$
22. m, $\times 10^{-3}$
23. $\times 10^{-12}$
24. M, $\times 10^6$

연습문제 33 (73쪽)

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

연습문제 34 (75쪽)

1. 60 kPa
2. 150 μW 또는 0.15 mW
3. 50 MV
4. 55 nF
5. 100 kW
6. 0.54 mA 또는 540 μA
7. 1.5 M
8. 22.5 mV
9. 35 GHz
10. 15 pF
11. 17 μA
12. 46.2 kΩ
13. 3 μA
14. 2.025 MHz
15. 50 kN
16. 0.3 nF
17. 62.50 m
18. 0.0346 kg
19. 13.5×10^{-3}
20. 4×10^3
21. 3.8×10^5 km
22. 0.053 nm
23. 5.6 MPa
24. 4.3×10^{-3} m 또는 4.3 mm

제9장

연습문제 35 (78쪽)

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 36 (81쪽)

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 37 (82쪽)

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 38 (84쪽)

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 $\frac{1}{b^{12}}$

제10장

연습문제 39 (86쪽)

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 40 (88쪽)

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. $\dfrac{3x}{y}$
18. 0
19. $\dfrac{2r}{t}$
20. $(a+b)(y+1)$
21. $(p+q)(x+y)$
22. $(x-y)(a+b)$
23. $(a-2b)(2x+3y)$
24. $\dfrac{A^2}{pg}\left(\dfrac{A}{pg^2}-\dfrac{1}{g}+A^3\right)$

연습문제 41 (90쪽)

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

제11장

연습문제 42 (93쪽)

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 43 (95쪽)

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. ± 12	22. $-3\frac{1}{3}$	23. ± 3	24. ± 4

연습문제 44 (97쪽)

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

연습문제 45 (99쪽)

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

제12장

연습문제 46 (103쪽)

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. $L = \frac{XL}{2\pi f}$
11. $R = \frac{E}{I}$
12. $x = a(y-3)$
13. $C = \frac{5}{9}(F-32)$
14. $f = \frac{1}{2\pi CX_C}$

연습문제 47 (105쪽)

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. $b = \sqrt{\left(\frac{y}{4ac^2}\right)}$
9. $x = \frac{ay}{\sqrt{(y^2-b^2)}}$
10. $L = \frac{gt^2}{4\pi^2}$
11. $u = \sqrt{v^2-2as}$
12. $R = \sqrt{\left(\frac{360A}{\pi\theta}\right)}$
13. $a = N^2y - x$
14. $L = \frac{\sqrt{Z^2-R^2}}{2\pi f}$, 0.080
15. $v = \sqrt{\frac{2L}{\rho ac}}$
16. $V = \frac{k^2H^2L^2}{\theta^2}$

연습문제 48 (107쪽)

1. 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. $t_2 = t_1 + \frac{Q}{mc}$, 55
10. $v = \sqrt{\left(\frac{2dgh}{0.03L}\right)}$, 0.965
11. $l = \frac{8S^2}{3d} + d$, 2.725
12. $C = \frac{1}{\omega\{\omega L - \sqrt{Z^2-R^2}\}}$, 63.1×10^{-6}
13. 64 mm
14. $\lambda = \sqrt[5]{\left(\frac{a\mu}{\rho CZ^4 n}\right)^2}$

15. $w = \dfrac{2R - F}{L}$; $3\,\mathrm{kN/m}$

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

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

18. $F = EI\left(\dfrac{n\pi}{L}\right)^2$; $13.61\,\mathrm{MN}$

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

20. $\ell = \sqrt[3]{\left(\dfrac{20\,g\,H^2}{I\rho^4 D^2}\right)^2}$

제13장

연습문제 49 (111쪽)

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 50 (113쪽)

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 51 (115쪽)

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 52 (118쪽)

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. $a=12,\ b=0.40$
8. $a=4,\ b=10$
9. $F_1=1.5,\ F_2=-4.5$
10. $R_1=5.7\,\mathrm{kN},\ R_2=6.3\,\mathrm{kN}$

연습문제 53 (120쪽)

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. $F_1=2,\ F_2=-3,\ F_3=4$

제14장

연습문제 54 (124쪽)

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 55 (126쪽)

1. $-3.732,\ -20.268$
2. $-3.137,\ 0.637$
3. $1.468,\ -81.135$
4. $1.290,\ 0.310$
5. $2.443,\ 0.307$
6. $-2.851,\ 0.351$

연습문제 56 (127쪽)

1. $0.637,\ -73.137$
2. $0.296,\ -60.792$
3. $2.781,\ 0.719$
4. $0.443,\ -31.693$
5. $3.608,\ -81.108$
6. $1.434,\ 0.232$
7. $0.851,\ -12.351$
8. $2.086,\ -60.086$
9. $1.481,\ -11.081$
10. $4.176,\ -61.676$
11. $4,\ 2.167$
12. $7.141,\ r-13.641$
13. $4.562,\ 0.438$

연습문제 57 (129쪽)

1. $1.191\,\mathrm{s}$
2. $0.345\,\mathrm{A},\ 0.905\,\mathrm{A}$
3. $7.84\,\mathrm{cm}$
4. $0.619\,\mathrm{m},\ 19.38\,\mathrm{m}$
5. 0.0133
6. $1.066\,\mathrm{m}$
7. $86.78\,\mathrm{cm}$
8. $1.835\,\mathrm{m},\ 18.165\,\mathrm{m}$
9. $7\,\mathrm{m}$
10. $12\,\Omega,\ 28\,\Omega$
11. $0.52\,\mathrm{s}$ 그리고 $5.73\,\mathrm{s}$
12. $400\,\mathrm{rad/s}$

연습문제 58 (130쪽)

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

제15장

연습문제 59 (133쪽)

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 60 (135쪽)

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 61 (137쪽)

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

제16장

연습문제 62 (140쪽)

1. (a) 0.1653 (b) 0.4584 (c) 22030
2. (a) 5.0988 (b) 0.064037 (c) 40.446
3. (a) 4.55848 (b) 2.40444 (c) 8.05124
4. (a) 48.04106 (b) 4.07482 (c) -0.08286
5. 2.739
6. 120.7 m

연습문제 63 (142쪽)

1. 2.0601
2. (a) 7.389 (b) 0.7408
3. $1-2x^2-\frac{8}{3}x^3-2x^4$
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 64 (143쪽)

1. 3.95, 2.05
2. 1.65, -1.30
3. (a) 28 cm^3 (b) 116 min
4. (a) 70 °C (b) 5 min

연습문제 65 (146쪽)

1. (a) 0.55547 (b) 0.91374 (c) 8.8941
2. (a) 2.2293 (b) -0.33154 (c) 0.13087
3. -0.4904
4. -0.5822
5. 2.197
6. 816.2
7. 0.8274
8. 11.02
9. 1.522
10. 1.485
11. 1.962
12. 3
13. 4
14. 147.9
15. 4.901
16. 3.095
17. $t=e^{b+a\ln D}=e^b e^{a\ln D}=e^b e^{\ln D^a}$, 즉 $t=e^b D^a$
18. 500
19. $W=PV\ln\left(\frac{U_2}{U_1}\right)$
20. 992 m/s
21. 348.5 Pa

연습문제 66 (149쪽)

1. (a) 150 °C (b) 100.5 °C
2. 99.21 kPa
3. (a) 29.32 V (b) 71.31×10^{-6} s
4. (a) 1.993 m (b) 2.293 m
5. (a) 50 °C (b) 55.45 s
6. 30.37 N
7. (a) 3.04 A (b) 1.46 s
8. 2.45 $\mathrm{mol/cm}^3$
9. (a) 7.07 A (b) 0.966 s
10. 2066만 원
11. (a) 100% (b) 67.03% (c) 1.83%
12. 2.45 mA
13. 142 ms
14. 99.752%
15. 20분 38초

제17장

연습문제 67 (155쪽)

1. (a) 수평축: $1\,\mathrm{cm}=4\,\mathrm{V}$ (또는 $1\,\mathrm{cm}=5\,\mathrm{V}$), 수직축: $1\,\mathrm{cm}=10\,\Omega$
   (b) 수평축: $1\,\mathrm{cm}=5\,\mathrm{m}$, 수직축: $1\,\mathrm{cm}=0.1\,\mathrm{V}$
   (c) 수평축: $1\,\mathrm{cm}=10\,\mathrm{N}$, 수직축: $1\,\mathrm{cm}=0.2\,\mathrm{mm}$

2. (a) -1 (b) -8 (c) -1.5 (d) 4 3. 14.5 4. (a) -1.1 (b) -1.4

5. $1010\,\mathrm{rev/min}$은 $1070\,\mathrm{rev/min}$이 되어야 한다. ;
   (a) $1000\,\mathrm{rev/min}$ (b) $167\,\mathrm{V}$

연습문제 68 (161쪽)

1. 표시되지 않은 값들: -0.75, 0.25, 0.75, 1.75, 2.25 ,2.75; 기울기 $=\dfrac{1}{2}$
2. (a) 4, -2 (b) -1, 0 (c) -3, -4 (d) 0, 4
3. (a) 2, $\dfrac{1}{2}$ (b) 3, $-2\dfrac{1}{2}$ (c) $\dfrac{1}{24}$, $\dfrac{1}{2}$
4. (a) 6, -3 (b) -2, 4 (c) 3, 0 (d) 0, 7
5. (a) 2, $-\dfrac{1}{2}$ (b) $-\dfrac{2}{3}$, $-1\dfrac{2}{3}$ (c) $\dfrac{1}{18}$, 2 (d) 10, $-4\dfrac{2}{3}$
6. (a) $\dfrac{3}{5}$ (b) -4 (c) $-1\dfrac{5}{6}$ 7. (a)와 (c), (b와 (e)
8. (2, 1) 9. (1.5, 6) 10. (1, 2)
11. (a) $89\,\mathrm{cm}$ (b) $11\,\mathrm{N}$ (c) 2.4 (d) $l=2.4W+48$ 12. $P=0.15W+3.5$
13. $a=-20$, $b=412$

연습문제 69 (166쪽)

1. (a) $40\,^{\circ}\mathrm{C}$ (b) $128\,\Omega$ 2. (a)$850\,\mathrm{rev/min}$ (b) $77.5\,\mathrm{V}$
3. (a) 0.25 (b) 12 (c) $F=0.25L+12$ (d) $89.5\,\mathrm{N}$ (e) $592\,\mathrm{N}$ (f) $212\,\mathrm{N}$
4. -0.003, $8.73\,\mathrm{N/cm^2}$ 5. (a) $22.5\,\mathrm{m/s}$ (b) $6.5\,\mathrm{s}$ (c) $v=0.7t+15.5$
6. $m=26.8L$ 7. (a) $1.25t$ (b) 21.6% (c) $F=-0.095W+2.2$
8. (a) $96\times10^{9}\,\mathrm{Pa}$ (b) 0.00022 (c) $29\times10^{6}\,\mathrm{Pa}$
9. (a) $\dfrac{1}{5}$ (b) 6 (c) $E=\dfrac{1}{5}L+6$ (d) $12\,\mathrm{N}$ (e) $65\,\mathrm{N}$
10. $a=0.85$, $b=12{,}254.3\,\mathrm{kPa}$, $275.5\,\mathrm{kPa}$, $280\,\mathrm{K}$

제18장

연습문제 70 (172쪽)

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. $a = 1.5,\ b = 0.4,\ 11.78\,\mathrm{mm}^2$
7. $y = 2x^2 + 7, 5.15$
8. (a) 950 (b) 317 kN
9. $a = 0.4,\ b = 8.6$ (a) 94.4 (b) 11.2

연습문제 71 (176쪽)

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. $I = 0.0012\,\mathrm{V}^2$, 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. $T_0 = 35.3\,\mathrm{N},\ \mu = 0.27,\ 64.8\,\mathrm{N},\ 1.29$ 라디안

제19장

연습문제 72 (178쪽)

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 73 (182쪽)

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) ± 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) 2.75와 -1.50 (c) $2.3,\ -0.8$

연습문제 74 (183쪽)

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 75 (184쪽)

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. $x=-1.5$

제20장

연습문제 76 (188쪽)

1. $82^\circ 27'$ 2. $27^\circ 54'$ 3. $51^\circ 11'$ 4. $100^\circ 6'52''$
5. $15^\circ 44'17''$ 6. $86^\circ 49'1''$ 7. 72.55° 8. 27.754°
9. $37^\circ 57'$ 10. $58^\circ 22'52''$

연습문제 77 (190쪽)

1. 우각 2. 둔각 3. 예각 4. 직각
5. (a) 21° (b) $62^\circ 23'$ (c) $48^\circ 56'17''$ 6. (a) 102° (b) 165° (c) $10^\circ 18'49''$
7. (a) 60° (b) 110° (c) 75° (d) 143° (e) 140° (f) 20° (g) 129.3° (h) 79° (i) 54°
8. 횡단선

(a) 1 3, 2 4, 5 7, 6 8

(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

9. $59^\circ 20'$ 10. $a = 69^\circ$, $b = 21^\circ$, $c = 82^\circ$ 11. 51°
12. 1.326 rad 13. 0.605 rad 14. $40^\circ 55'$

연습문제 78 (193쪽)

1. (a) 예각인 부등변인 예각삼각형 (b) 이등변삼각형 (c) 직각이등변삼각형
   (d) 부등변인 둔각삼각형 (e) 정삼각형 (f) 직각삼각형
2. $a = 40^\circ$, $b = 82^\circ$, $c = 66^\circ$, $d = 75^\circ$, $e = 30^\circ$, $f = 75^\circ$ 3. DF, DE 4. 52°
5. 122.5° 6. $\phi = 51^\circ$, $x = 161^\circ$ 7. 40°, 70°, 70°, 125°, 이등변삼각형
8. $a = 18^\circ 50'$, $b = 71^\circ 10'$, $c = 68^\circ$, $d = 90^\circ$, $e = 22^\circ$, $f = 49^\circ$, $g = 41^\circ$
9. $a = 103^\circ$, $b = 55^\circ$, $c = 77^\circ$, $d = 125^\circ$, $e = 55^\circ$, $f = 22^\circ$, $g = 103^\circ$,

   $h = 77^\circ$, $i = 103^\circ$, $j = 77^\circ$, $k = 81^\circ$
10. 17° 11. $A = 37^\circ$, $B = 60^\circ$, $E = 83^\circ$

연습문제 79 (196쪽)

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

연습문제 80 (198쪽)

1. $x = 16.54$ mm, $y = 4.18$ mm 2. 9 cm, 7.79 cm 3. (a) 2.25 cm (b) 4 cm 4. 3 m

연습문제 81 (200쪽)

1. 20.6절 [문제 30~33]에서 작도한 방법과 비슷하게 작도한다.

제21장

연습문제 82 (203쪽)

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°　10. 20.81 km　11. 3.35 m, 10 cm　12. 132.7 해리
13. 2.94 mm　14. 24 mm

연습문제 83 (205쪽)

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 84 (207쪽)

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

연습문제 85 (210쪽)

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 86 (212쪽)

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

제22장

연습문제 87 (216쪽)

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

연습문제 88 (220쪽)

1. 5
2. 180°
3. 30
4. 120°
5. 1, 120°
6. 2, 144°
7. 3, 90°
8. 5, 720°
9. 3.5, 960°
10. 6, 360°
11. 4, 180°
12. 5 ms
13. 40 Hz
14. $100\,\mu$s, 0.1 ms
15. 625 Hz
16. 앞선다.
17. 앞선다.

연습문제 89 (222쪽)

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

제23장

연습문제 90 (226쪽)

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

연습문제 91 (228쪽)

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

연습문제 92 (229쪽)

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

연습문제 93 (231쪽)

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

제24장

연습문제 94 (235쪽)

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

연습문제 95 (236쪽)

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) $40\angle 18^\circ$, $40\angle 90^\circ$, $40\angle 162^\circ$, $40\angle 234^\circ$, $40\angle 306^\circ$

   (b) $(38.04,\ 12.36)$, $(0,\ 40)$, $(-38.04,\ 12.36)$, $(-23.51,\ -32.36)$, $(23.51,\ -32.36)$
10. $47.0\,\mathrm{mm}$

제25장

연습문제 96 (239쪽)

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

연습문제 97 (242쪽)

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

연습문제 98 (244쪽)

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

연습문제 99 (246쪽)

1. $1932\,\mathrm{mm}^2$ 2. $1624\,\mathrm{mm}^2$ 3. (a) $0.918\,\mathrm{ha}$ (b) $456\,\mathrm{m}$

연습문제 100 (246쪽)

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

제26장

연습문제 101 (249쪽)

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 102 (250쪽)

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° (b) 80° (c) 105°
4. (a) $0^\circ 43'$ (b) $154^\circ 8'$ (c) $414^\circ 53'$
5. 104.7 rad/s

연습문제 103 (252쪽)

1. 113 cm^2
2. 2376 mm^2
3. 1790 mm^2
4. 802 mm^2
5. 1709 mm^2
6. 1269 m^2
7. 1548 m^2
8. (a) 106.0 cm (b) 783.9 cm^2
9. 21.46 m^2
10. 17.80 cm, 74.07 cm^2
11. (a) 59.86 mm (b) 197.8 mm
12. 26.2 cm
13. 202 mm^2
14. 8.67 cm, 54.48 cm
15. 82.5°
16. 748
17. (a) 0.698 rad (b) 804.2 m^2
18. 10.47 m^2
19. (a) 396 mm^2 (b) 42.24%
20. 701.8 mm
21. 7.74 mm

연습문제 104 (256쪽)

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

제27장

연습문제 105 (260쪽)

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

연습문제 106 (264쪽)

1. $201.1\,cm^3$, $159.0\,cm^2$ 2. $7.68\,cm^3$, $25.81\,cm^2$ 3. $113.1\,cm^3$, $113.1\,cm^2$
4. $5.131\,cm$ 5. $3\,cm$ 6. $2681\,mm^3$
7. (a) $268083\,mm^3$, $268.083\,cm^3$ (b) $20106\,mm^2$, $201.06\,cm^2$
8. $8.53\,cm$ 9. (a) $512 \times 106\,km^2$ (b) $1.09 \times 1012\,km^3$
10. 664 11. $92\,m^3$, $92{,}000\,L$

연습문제 107 (268쪽)

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

연습문제 108 (273쪽)

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

연습문제 109 (274쪽)

1. $8 : 125$ 2. $137.2\,g$

제28장

연습문제 110 (277쪽)

1. 4.5 단위 제곱 2. 54.7 단위 제곱 3. 63.33 m 4. 4.70 ha
5. 143 m^2

연습문제 111 (278쪽)

1. 42.59 m^3 2. 147 m^3 3. 20.42 m^3

연습문제 112 (281쪽)

1. (a) 2 A (b) 50 V (c) 2.5 A 2. (a) 2.5 mV (b) 3 A 3. 0.093 As, 3.1 A
4. (a) 31.83 V (b) 0 5. 49.13 cm^2, 368.5 kPa

제29장

연습문제 113 (284쪽)

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 114 (290쪽)

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

연습문제 115 (293쪽)

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

연습문제 116 (294쪽)

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

연습문제 117 (294쪽)

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

제30장

연습문제 118 (297쪽)

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

연습문제 119 (298쪽)

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

연습문제 120 (300쪽)

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

연습문제 121 (302쪽)

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) $305.3\sin(314.2t-0.233)\,\mathrm{V}$ (b) $50\,\mathrm{Hz}$
7. (a) $10.21\sin(628.3t+0.818)\,\mathrm{V}$ (b) $100\,\mathrm{Hz}$ (c) $10\,\mathrm{ms}$
8. (a) $79.83\sin(300\pi t+0.352)\,\mathrm{V}$ (b) $150\,\mathrm{Hz}$ (c) $6.667\,\mathrm{ms}$
9. $150.6\sin(\omega t-0.247)\,\mathrm{V}$

제31장

연습문제 122 (304쪽)

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

연습문제 123 (307쪽)

1. 하나의 기호가 10대의 자동차를 나타내는데 사용된다면, 5대 단위에서 보정하여 각각 3.5, 4.5, 6, 7, 5 그리고 4개의 기호로 나타난다.
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. Q와 R이 줄어든 반면에 P는 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%.
   A와 B는 중앙에서 약간 변화가 있고, C는 약 8% 감소하고 D는 약 7% 증가 그리고 E는 약 3% 감소했다.
9. 각각 중심각이 7.5°, 22.5°, 52.5°, 167.5°, 110°로 분할된 임의의 크기인 원
10. 각각 중심각이 107°, 156°, 29°, 68°로 분할된 임의의 크기인 원
11. (a) 495000원 (b) 88
12. (a) 16450000원 (b) 138

연습문제 124 (313쪽)

1. 유일한 풀이는 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, $\cdots$이고 높이가 각각 1, 5, 9, 17, $\cdots$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

제32장

연습문제 125 (316쪽)

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 126 (318쪽)

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 127 (320쪽)

1. 4.60
2. 2.83 μF
3. 평균 34.53 MPa, 표준편차 0.07474 MPa
4. 0.296 kg
5. 9.394 cm
6. 0.00544 cm

연습문제 128 (322쪽)

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

제33장

연습문제 129 (326쪽)

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. $\frac{5}{36}$
5. (a) $\frac{2}{5}$ (b) $\frac{1}{5}$ (c) $\frac{4}{15}$ (d) $\frac{13}{15}$
6. (a) $\frac{1}{250}$ (b) $\frac{1}{200}$ (c) $\frac{9}{1000}$ (d) $\frac{1}{50000}$

연습문제 130 (328쪽)

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

제34장

연습문제 131 (332쪽)

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

연습문제 132 (333쪽)

1. 16, 8

연습문제 133 (336쪽)

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 134 (338쪽)

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

연습문제 135 (340쪽)

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 136 (340쪽)

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

연습문제 137 (341쪽)

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. 증명 문제

연습문제 138 (342쪽)

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

제35장

연습문제 139 (346쪽)

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 140 (348쪽)

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. $77.7\,\mathrm{m}^3$

연습문제 141 (352쪽)

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

제36장

연습문제 142 (354쪽)

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

연습문제 143 (355쪽)

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 144 (356쪽)

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

연습문제 145 (358쪽)

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 146 (360쪽)

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

연습문제 147 (361쪽)

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

제37장

연습문제 148 (364쪽)

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 149 (366쪽)

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 150 (366쪽)

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 151 (368쪽)

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 152 (371쪽)

1. 231_{10}	2. 44_{10}	3. 152_{10}	4. 753_{10}	5. 36_{16}
6. $C8_{16}$	7. 5B16	8. EE16		

연습문제 153 (372쪽)

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

제38장

연습문제 154 (374쪽)

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 155 (375쪽)

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 156 (376쪽)

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

연습문제 157 (377쪽)

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 158 (378쪽)

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. $k \geq \left(\sqrt{\frac{13}{4}}+\frac{1}{2}\right), k \leq \left(-\sqrt{\frac{13}{4}}+\frac{1}{2}\right)$

제39장

연습문제 159 (382쪽)

1. $a=12,\ n=1.8,\ 451,\ 28.5$
2. $k=1.5,\ n=-13.\ m=3,\ n=2.5$

연습문제 160 (384쪽)

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

연습문제 161 (386쪽)

1. $a=76,\ k=-7\times10^{-5},\ p=76e^{-7\times10^{-5}h},\ 37.74\,\mathrm{cm}$
2. $\theta_0=152,\ k=-0.05$