Exercises [A–2]

Solve by substitution:

1. $l = 3\,w$
   $l + w = 124$

2. $a + b = 1.3$
   $a - 0.5 = b$

3. $x - y = 0$
   $2\,x - 3\,y = 1$

4. $y = 42 - 7\,x$
   $3\,x - y = 8$

5. $m - 8 = b$
   $m + 3 = 2(b + 3)$

6. $3\,x + 2\,y = 8$
   $y = x - 1$

7. $3\,a + 5\,b = 7$
   $b - 4\,a = 6$

8. $p - 5\,q = 6$
   $3\,p - 2\,q = 5$

9. $3\,x = 5\,y$
   $6\,x - y = 6$

10. $3\,x - 2\,y = 5$
    $5\,x + 3\,y = 11\frac{1}{2}$

11. $3\,x - y = 1$
    $2\,x + 3\,y = 5$

12. $4\,a = 7\,b - 1$
    $8\,a = 15\,b - 5$

13. $\begin{cases} h + q + d = 19 \\ 50\,h + 25\,q + 10\,d = 470 \\ q = 2\,h \end{cases}$

14. $\begin{cases} K = \frac{1}{2}\,rc \\ c = 2\,\pi r \end{cases}$
    Find K in terms of r.

15. $\begin{cases} K = \frac{1}{2}\,sh \\ h = \dfrac{s}{2} \end{cases}$
    Find K in terms of s.

Exercises [B]

1. $\begin{cases} S = \dfrac{n}{2}\,(a + l) \\ l = a + (n - 1)d \end{cases}$
   Eliminate l and derive a formula for S.

2. $\begin{cases} K = \frac{1}{2}\,sh \\ s = \dfrac{2\,h}{3}\sqrt{3} \end{cases}$
   Find K in terms of h.

3. $\begin{cases} V = Bh \\ B = \pi r^2 \end{cases}$
   Eliminate B and derive a formula for V.

4. $\begin{cases} S = 4\,\pi r^2 \\ d = 2\,r \end{cases}$
   Eliminate r and derive a formula for S.

5. $\begin{cases} V = \frac{1}{2}\,h(\pi r_1^2 + \pi r_2^2) + \frac{1}{6}\,\pi h^3 \\ r_2 = 0, \quad r_1^2 = (2\,r - h)h \end{cases}$
   Eliminate r_2 and r_1, and derive a formula for V.

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1. (1,1) 2. (1,2) 3. $(6,1\frac{1}{4})$ 4. (0,0) 5. (1,0) 6. (3,-1)

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1. n = 2, t = 8
2. x = 7, y = 5
3. $m = 2\frac{1}{4}$, $w = \frac{3}{4}$
4. d = 11, q = 9
5. b = 5, c = 105
6. x = 100, y = 125
7. x = 5, y = 3
8. $x = 2\frac{3}{4}$, $z = -\frac{1}{2}$
9. a = 1, b = 2
10. $p = \frac{1}{14}$, $q = \frac{5}{28}$
11. $x = -\frac{1}{4}$, $y = \frac{1}{4}$
12. $x = \frac{33}{85}$, $y = \frac{4}{85}$
13. x = 20, y = 60, z = 100
14. $A = \frac{C^2}{4\pi}$
15. $C = 2\pi r$
16. $A = 3a^2$

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1. $\ell = 93$, w = 31
2. a = 0.9, b = 0.4
3. x = -1, y = -1
4. x = 5, y = 7
5. b = 5, m = 13
6. x = 2, y = 1
7. a = -1, b = 2
8. p = 1, q = -1
9. $x = 1\frac{1}{9}$, $y = \frac{2}{3}$
10. $x = 2$, $y = \frac{1}{2}$
11. $x = \frac{8}{11}$, $y = 1\frac{2}{11}$
12. a = 5, b = 3
13. d = 7, h = 4, q = 8
14. $K = \pi r^2$
15. $K = \frac{s^2}{4}$

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1. $S = \frac{n}{2}(2a + nd - d)$
2. $K = \frac{h^2}{3}\sqrt{3}$
3. $V = \pi r^2 h$
4. $S = \pi d^2$
5. $V = \pi h^2(r - \frac{h}{3})$
6. b = 8, B = 10, s = 16
7. A = 12, B = 16, C = 34
8. f = 6, s = 13, F = 9, t = 18
9. t = 70, w = 75, T = 30, F = 50

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1. x = 4, y = 1
2. $a = -7\frac{1}{2}$, $b = 1\frac{1}{2}$
3. x = 3, y = 2
4. d = 1, e = -4
5. $x = 3$, $y = -\frac{1}{2}$
6. $a = \frac{1}{3}$, b = -1
7. x = 2, y = -3
8. x = -2, y = -1
9. p = -7, q = -3
10. $y = \frac{1}{2}$, z = -4
11. p = 0, q = 5
12. $a = 1\frac{1}{2}$, $b = -\frac{1}{2}$
13. a = -2, b = 3
14. $r = \frac{1}{38}$, $s = -\frac{7}{57}$
15. x = 1.2, y = -1.8
16. x = .5, y = -.2
17. x = 200, y = 300