



## Answers

| 1. | <b>a</b> ) $y = 2x - 3$           | <b>(b)</b> $y = 3x + 5$           | (c) $y = -3x + 4$                                  |
|----|-----------------------------------|-----------------------------------|--|
|    | <b>d</b> ) $y = -x - 6$           | (e) $y = 4x - 9$                  | (f) $y = -4x - 14$                                 |
|    |                                   |                                   |  |
| 2. | <b>a</b> ) x < 4                  | <b>(b)</b> $y \ge 3$              | (c) $w > -4$                                       |
|    | $\mathbf{d})  \mathbf{k} \leq -2$ | (e) $x < 3$                       | (f) $x \ge -3$                                     |
|    | <b>g</b> ) x < 8                  | $(\mathbf{h})  \mathbf{m} \leq 4$ |  |
|    |                                   |                                   |  |
| 3. | <b>a</b> ) $2f + 3s = -13$        | <b>(b)</b> $3a + 4c = 75$         | (c) $2a + 3c = 88$                                 |
| 4. | <b>a</b> ) $x = 2, y = 3$         | <b>(b)</b> $m = 1$ , $n = -1$     | (c) $a = 3, b = 4$                                 |
| 5. | £9.70                             | <b>6.</b> £28                     |  |
| 7. | <b>a</b> ) $x = \frac{y-p}{2}$    | <b>(b)</b> $x = \frac{p-u}{v}$    | (c) $x = \frac{n}{2m}$ (d) $x = \frac{8y+16}{7}$   |
|    | e) $x = \frac{5a-50}{6}$          | (f) $x = \frac{m-3}{6}$           | (g) $x = \frac{h+12}{20}$ (h) $x = \frac{2d+6}{5}$ |
|    | i) $x = \frac{c-5}{4a}$           |                                   |  |
|    |                                   |                                   |  |
|    |                                   |                                   |  |

8. a) k = 5 (b) k = 3 (c) k = 2d) k = -2 (e) k = 6 (f)  $k = -\frac{1}{2}$  **9.** a)  $y = (x-4)^2 + 2$  (b)  $y = (x+3)^2 - 2$  (c)  $y = (x-3)^2 - 9$ 

**10.** a) 
$$y = (x - 3)^2 + 2$$
 (b)  $y = (x + 2)^2 - 16$ 

- **11.** a) x = 4 (4, -3) Min(e) x = -2 (-2, -6) Minb) x = -2 (-2, 5) Min(f) x = -3 (-3, 1) Minc) x = 2 (2, 3) Min(g) x = -5 (-5, -8) Mind) x = 1 (1, 3) Min(h) x = 6 (6, 3) Min
- 12 a) Sketch of a Parabola with Min TP @ (5, -1) Roots at x = 4 & 6 y-intercept @ (0, 2)
  b) Sketch of a Parabola with Min TP @ (1, -25) Roots at x = -4 & 6 y-intercept @ (0, -24)
  c) Sketch of a Parabola with Min TP @ (-2, -36) Roots at x = -8 & 4 y-intercept @ (0, -2)
  d) Sketch of a Parabola with Min TP @ (-4, -4) Roots at x = -6 & -2 y-intercept @ (0, 12)
  e) Sketch of a Parabola with Min TP @ (2, -36) Roots at x = -4 & 8 y-intercept @ (0, -32)
  f) Sketch of a Parabola with Min TP @ (1, -16) Roots at x = -3 & 5 y-intercept @ (0, -15)
- **13.** a) x = 5, x = 7(b) x = 3, x = -2(c) x = -1, x = 5d) x = -4, x = -6(e) x = 2, x = -6(f) x = -6, x = -3g) x = -2, x = 7(h) x = 6, x = 1
- **14.** a) x = -0.46, -6.54 (b) x = 2.79, -1.79 (c) -x = 10.48, -0.48 d) x = -0.88, -5.12
- 15. a) Hits ground when h = 0 so t = -0.19, t = 2.69 time can't be negative so t = 2.69 seconds
  b) Hits ground when h = 0 so t = -0.7, t = 10.7 time can't be negative so t = 10.7 seconds
  c) Hits ground when h = 0 so t = -0.37, t = 6.37 time can't be negative so t = 6.37 seconds

- **16. a)**  $b^2 4ac = 0$ , so real and equal roots
  - c)  $b^2 4ac = 0$ , so real and equal roots
  - e)  $b^2 4ac > 0$ , so real and distinct roots
  - **g**)  $b^2 4ac > 0$ , so real and distinct roots
  - i)  $b^2 4ac = 0$ , so real and equal roots

- (b)  $b^2 4ac < 0$ , so no real roots
- (d)  $b^2 4ac > 0$ , so real and distinct roots
- (f)  $b^2 4ac < 0$ , so no real roots
- (**h**)  $b^2 4ac > 0$ , so real and distinct roots
- (j)  $b^2 4ac < 0$ , so no real roots

17.  $18.6^2 + 24.8^2 \neq 31.2^2$ , therefore the triangle is not right angled.

- **18.**  $15.6^2 + 11.7^2 = 19.5^2$ , therefore the triangle is right angled and he has been successful.
- **19.**  $1.6^2 + 4.3^2 \neq 4.5^2$ , therefore the triangle is not right angled.
- 20. 27cm
- **21.** 3.45m, since 3.45 < 5 the tunnel does not mee the safety regulations.
- 22. 138°
   23. 132°

   24. 34°
   25. 22°

   26. 40°
   27. 15cm²
- **28.** 112.5cm<sup>2</sup> **29.** 625ml
- **30.** 64000cm<sup>3</sup> **31.** 375cm<sup>3</sup>
- **32.** a)  $120^{\circ}$  (b)  $135^{\circ}$  (c)  $144^{\circ}$
- **32.** a) Sketch of Sine curve with amplitude 2 and period  $360^{\circ}$ 
  - **b**) Sketch of Sine curve with amplitude 4 and period 360°
  - c) Sketch of Cosine curve with amplitude 2 and period 360°
  - d) Sketch of Cosine curve with amplitude 3 and period 360°
  - e) Sketch of Sine curve with amplitude 6 and period  $360^{\circ}$
  - f) Sketch of Cosine curve with amplitude 10 and period  $360^{\circ}$

| 33.                | a)  | Period = $120^{\circ}$ Amplitude = 1 | <b>(b)</b> Period = 120                | $^{\circ}$ Amplitude = 1      |  |  |
|--------------------|---|--------------------------------------|--|-------------------------------|--|--|
|                    | c)  | Period = $90^{\circ}$ Amplitude = 1  | (d) Period = $60^{\circ}$              | Amplitude = 1                 |  |  |
|                    | e)  | Period = $120^{\circ}$ Amplitude = 2 | $(f)  \text{Period} = 180^\circ$       | • Amplitude $= 4$             |  |  |
|                    | <b>g</b> )  | Period = $36^{\circ}$ Amplitude = 6  | ( <b>h</b> ) Period = $90^{\circ}$     | Amplitude $= 3$               |  |  |
|                    | i)  | Period = $60^{\circ}$ Amplitude = 7  | (j) Period = $40^{\circ}$              | Amplitude = 3                 |  |  |
| 34.                | a)  | a = 5, $b = 4$                       | <b>(b)</b> $a = 1, b = 3$              |                               |  |  |
| 35.                | a)  | 5.74°, 174.26°                       | <b>(b)</b> 113.58°, 246.42°            | (c) 189.59°, 350.41°          |  |  |
|                    | d)  | $74.05^\circ$ , $254.05^\circ$       | (e) $78.46^{\circ}$ , $281.54^{\circ}$ | ( <b>f</b> ) 206.39°, 333.61° |  |  |
|                    | <b>g</b> )  | 48.19°, 311.81°                      |  |                               |  |  |
| 36.<br>37          | x-coordinate of point B is $120^{\circ}$ x-coordinate of point C is $240^{\circ}$ |                                      |  | C is 240°                     |  |  |
| <b>37.</b> 131.41° |   |                                      |  |                               |  |  |

**38.** x-coordinate of point A is  $44.43^{\circ}$  x-coordinate of point B is  $135.57^{\circ}$