

Intermediate 2 - Unit 3 - Practice NAB 1

Outcome 1

1. Express $\frac{(x+8)(x+1)}{(x+1)^2}$ in its simplest form. (1)

2. Simplify: (a) $\frac{9}{z} + \frac{4}{z}$ (b) $\frac{5}{y} - \frac{5}{b}$ (c) $\frac{x}{5a} \times \frac{p}{9}$ (d) $\frac{y}{b} \div \frac{2}{k}$ (4)

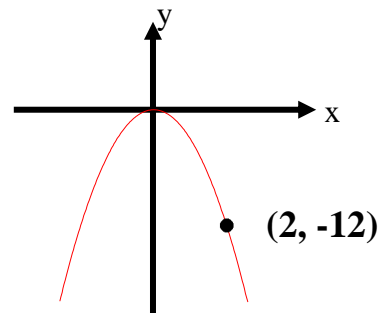
3. Change the subject of the formula to p: $Q = np + m$ (2)

4. Simplify: (a) $\sqrt{175}$ (b) $\frac{\sqrt{169}}{\sqrt{36}}$ (3)

5. Simplify: (a) $\frac{g^8 \times g^7}{g^6}$ (b) $9f^7 \times 5f^{-3}$ (4)

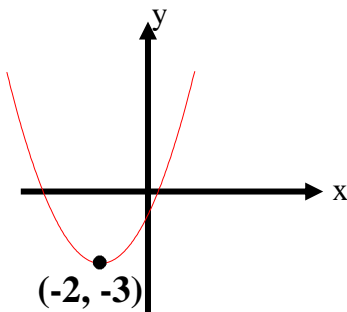
Outcome 2

6. The graph shows a function of the form $y = kx^2$. Write down its equation.



(1)

7.

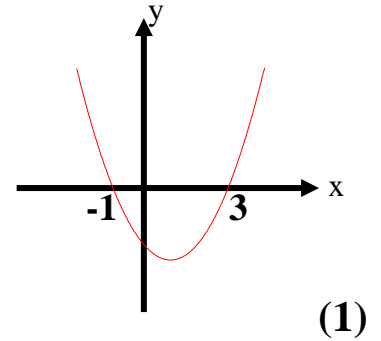


The equation of the quadratic function shown is of the form $y = (x - a)^2 + b$.

Write down its equation. (2)

8. A quadratic function has the equation $1 - (x + 1)^2$ write down:
- a) the equation of its axis of symmetry (1)
- b) the coordinates of the turning point and state whether it's a max or min. (2)

9. Use this graph to solve the equation $x^2 - 2x - 3 = 0$



10. Solve $y = x^2 - 4x + 3$ by factorization. (2)

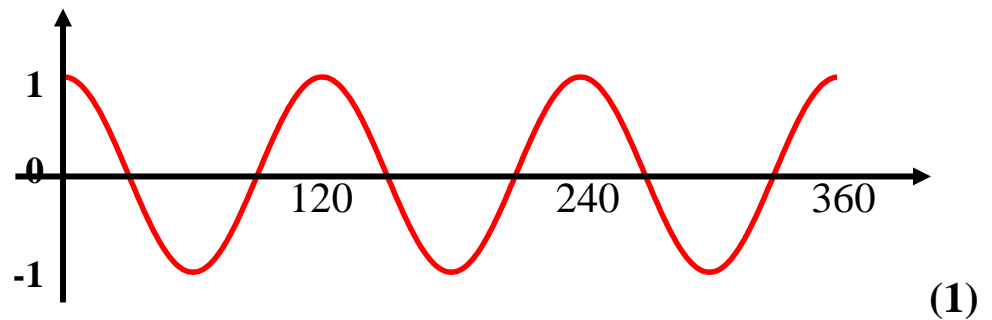
11. Use the quadratic formula to solve $y = x^2 + 4x - 4$ (4)

Outcome 3

12. Sketch the graph of $y = \sin 2x^\circ$ for $0^\circ \leq x \leq 360^\circ$ (2)

13. This diagram shows the graph of $y = \cos bx^\circ$ for $0^\circ \leq x \leq 360^\circ$

Write down the value of b.



14. Solve: $5\cos x^\circ - 3 = 0$, for $0^\circ \leq x \leq 360^\circ$ (3)

Intermediate 2 - Unit 3 - Practice NAB 1 Solutions

Outcome 1 - You need 9 out of 14 to pass.

1. $\frac{(x+8)}{(x+1)}$

2. a) $\frac{13}{z}$ (b) $\frac{5b-5y}{yb}$ (c) $\frac{xp}{45a}$ (d) $\frac{yk}{2b}$

3. $Q = np + m$ 4. a) $5\sqrt{7}$ (b) $\frac{13}{6}$

$Q - m = np$

$p = \frac{Q-m}{n}$

5. a) g^9 (b) $45g^4$

Outcome 2 - You need 9 out of 13 to pass.

6. $y = kx^2$ 7. $y = (x - a)^2 + b$
 $-12 = k \times 2^2$ $y = (x + 3)^2 - 2$
 $-12 = k \times 4$
 $k = -3$
 $y = -3x^2$

8. a) $x = -1$ (b) Max @ $(-1, 1)$

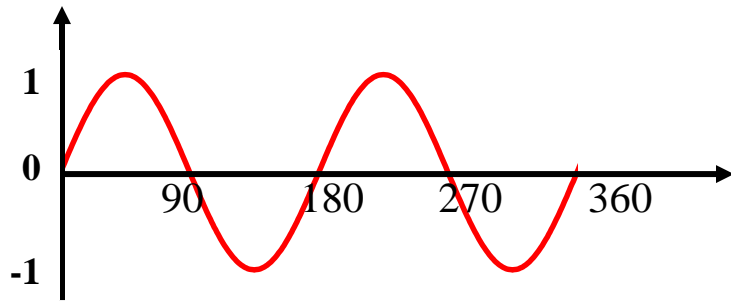
9. $x = -1, 3$

10. $(x - 3)(x - 1)$ so $x = 1, 3$

11. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-4 \pm \sqrt{4^2 - 4(1)(-4)}}{2}$
 $x = \frac{-4 \pm \sqrt{32}}{2}$
 $x = 0.83, -4.83$

Outcome 3 - You need 4 out of 6 to pass.

12.



13. $b = 3$

14. $5\cos x^\circ - 3 = 0$
 $5\cos x^\circ = 3$
 $\cos x^\circ = \frac{3}{5}$
 $x^\circ = 53.13^\circ$ or $360 - 53.13 = 306.87^\circ$

Intermediate 2 - Unit 3 - Practice NAB 2

Outcome 1

1. Express $\frac{(2x+3)(x+2)}{(x+2)^2}$ in its simplest form (1)

2. Simplify: (a) $\frac{5}{x} + \frac{3}{x}$ (b) $\frac{2}{y} - \frac{2}{x}$ (c) $\frac{3q}{r} \times \frac{p}{2}$ (d) $\frac{p}{3} \div \frac{q}{r}$ (4)

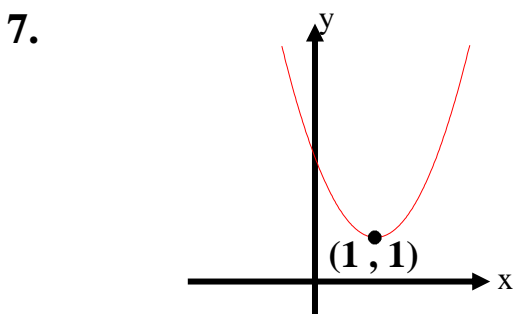
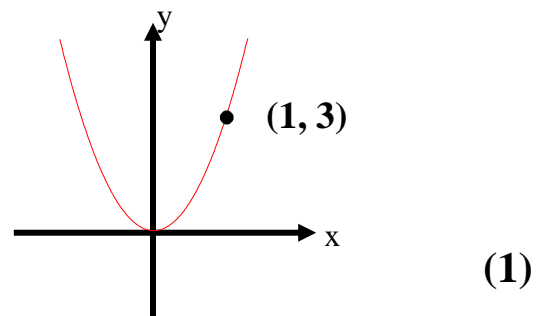
3. Change the subject of the formula to r: $p = qr + s$ (2)

4. Simplify: (a) $\sqrt{18}$ (b) $\frac{\sqrt{9}}{\sqrt{4}}$ (3)

5. Simplify: (a) $\frac{y^3 \times y^5}{y^2}$ (b) $2a^{\frac{3}{2}} \times 5a^{\frac{-1}{2}}$ (4)

Outcome 2

6. The graph shows a function of the form $y = kx^2$. Write down its equation.



The equation of the quadratic function shown is of the form $y = (x - a)^2 + b$. Write down its equation. (2)

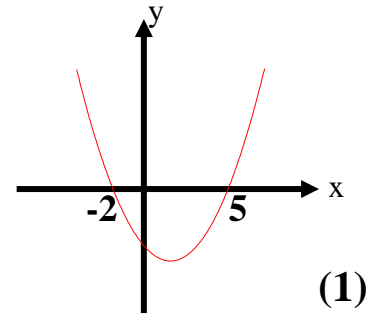
(2)

8. A quadratic function has the equation $y = (x + 3)^2 - 2$ write down:

a) the equation of its axis of symmetry (1)

b) the coordinates of the turning point and state whether it's a max or min. (2)

9. Use this graph to solve the equation $x^2 - 3x - 10 = 0$



10. Solve $y = x^2 + 7x + 6$ by factorization. (2)

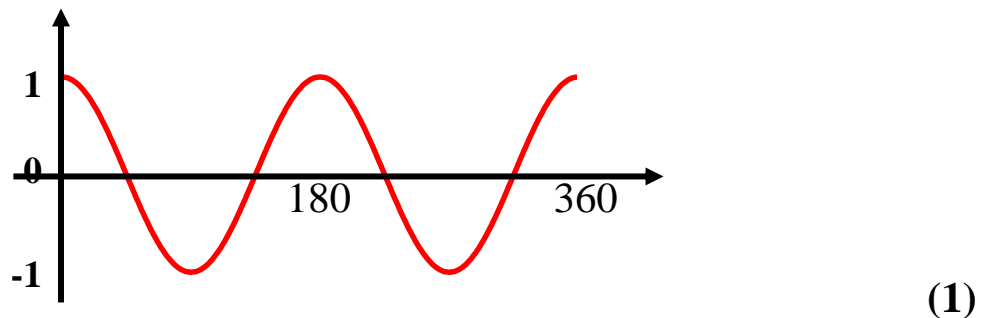
11. Use the quadratic formula to solve $y = x^2 + 3x - 1$ (3)

Outcome 3

12. Sketch the graph of $y = \sin 3x^\circ$ for $0^\circ \leq x \leq 360^\circ$ (2)

13. This diagram shows the graph of $y = \cos bx^\circ$ for $0^\circ \leq x \leq 360^\circ$

Write down the value of b.



14. Solve: $4\sin x^\circ + 3 = 0$, for $0^\circ \leq x \leq 360^\circ$ (3)

Intermediate 2 - Unit 3 - Practice NAB 2 Solutions

Outcome 1 - You need 9 out of 14 to pass.

1. $\frac{(2x+3)}{(x+2)}$

2. a) $\frac{8}{x}$ (b) $\frac{2x-2y}{xy}$ (c) $\frac{3pq}{2r}$ (d) $\frac{pr}{3q}$

3. $p = qr + s$ 4. a) $3\sqrt{2}$ (b) $\frac{3}{2}$

$$p - s = qr$$

$$r = \frac{p-s}{q}$$

5. a) y^6 (b) $10a$

Outcome 2 - You need 9 out of 13 to pass.

6. $y = kx^2$ 7. $y = (x - a)^2 + b$
 $3 = k \times 1^2$ $y = (x - 1)^2 + 1$
 $3 = k \times 1$
 $k = 3$
 $y = 3x^2$

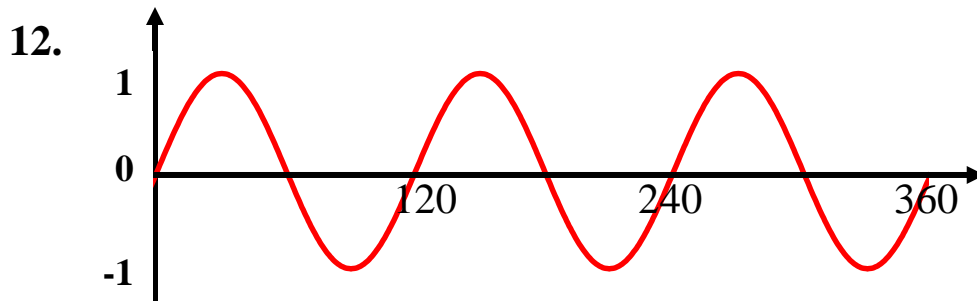
8. a) $x = -3$ (b) Min @ $(-3, -2)$

9. $x = -2, 5$

10. $(x + 6)(x + 1)$ so $x = -6, -1$

11. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-3 \pm \sqrt{3^2 - 4(1)(-1)}}{2}$
 $x = \frac{-3 \pm \sqrt{13}}{2}$
 $x = 0.30, -3.30$

Outcome 3 - You need 4 out of 6 to pass.



13. $b = 2$

14. $4\sin x^\circ + 3 = 0$
 $4\sin x^\circ = -3$
 $\sin x^\circ = -\frac{3}{4}$
 $x^\circ = 180 + 48.59 \text{ or } 360 - 48.59$
 $= 228.59, 311.41^\circ$

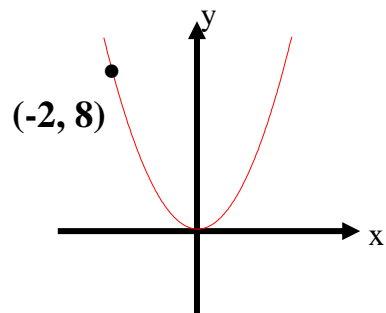
Intermediate 2 - Unit 3 - Practice NAB 3.

Outcome 1

1. Express $\frac{(x+3)(2x-2)}{(x+3)^2}$ in its simplest form. (1)
2. Simplify: a) $\frac{7}{x} + \frac{2}{x}$ (b) $\frac{3}{a} - \frac{3}{b}$ (c) $\frac{4n}{k} \times \frac{m}{3}$ (d) $\frac{h}{2} \div \frac{g}{e}$ (4)
3. Change the subject of the formula to a: $d = ab - c$ (2)
4. Simplify: a) $\sqrt{50}$ (b) $\frac{\sqrt{36}}{\sqrt{49}}$ (3)
5. Simplify: a) $\frac{y^2 \times y^5}{y^4}$ (b) $2b^{\frac{-3}{2}} \times 3b^{\frac{5}{2}}$ (4)

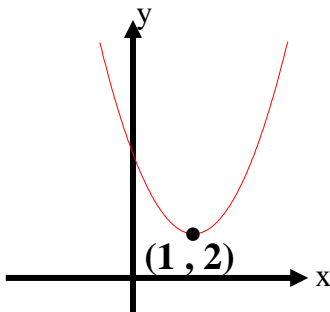
Outcome 2

6. The graph shows a function of the form $y = kx^2$. Write down its equation.



(1)

7.



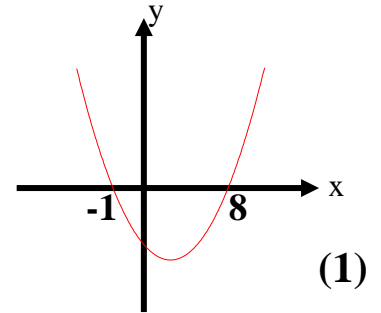
The equation of the quadratic function shown is of the form $y = (x - a)^2 + b$.

Write down its equation.

(2)

8. A quadratic function has the equation $y = (x - 4)^2 - 5$ write down:
- a) the equation of its axis of symmetry. (1)
- b) the coordinates of the turning point and state whether it's a max or min. (2)

9. Use this graph to solve the equation $x^2 - 3x - 10 = 0$



10. Solve $y = x^2 - 7x - 8$ by factorization. (2)

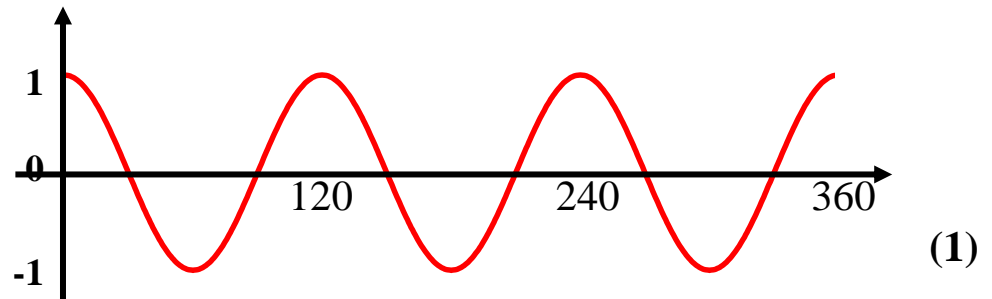
11. Use the quadratic formula to solve $y = x^2 - 3x - 5$ (4)

Outcome 3

12. Sketch the graph of $y = 2\sin 3x^\circ$ for $0^\circ \leq x \leq 360^\circ$ (2)

13. This diagram shows the graph of $y = a\cos bx^\circ$ for $0^\circ \leq x \leq 360^\circ$

Write down the value of b.



14. Solve: $6\cos x^\circ - 3 = 0$, for $0^\circ \leq x \leq 360^\circ$ (3)

Intermediate 2 - Unit 3 - Practice NAB 3 Solutions

Outcome 1 - You need 9 out of 14 to pass.

1. $\frac{(2x - 2)}{(x + 3)}$

2. a) $\frac{9}{x}$ (b) $\frac{3b - 3a}{ab}$ (c) $\frac{4mn}{3k}$ (d) $\frac{eh}{2g}$

3. $d = ab - c$ 4. a) $5\sqrt{2}$ (b) $\frac{6}{7}$
 $d + c = ab$
 $a = \frac{d + c}{b}$

5. a) y^3 (b) $6b$

Outcome 2 - You need 9 out of 13 to pass.

6. $y = kx^2$ 7. $y = (x - a)^2 + b$
 $8 = kx(-2)^2$ $y = (x - 1)^2 + 2$
 $8 = kx4$
 $k = 2$
 $y = 2x^2$

8. a) $x = 4$ (b) Min @ (4, -5)

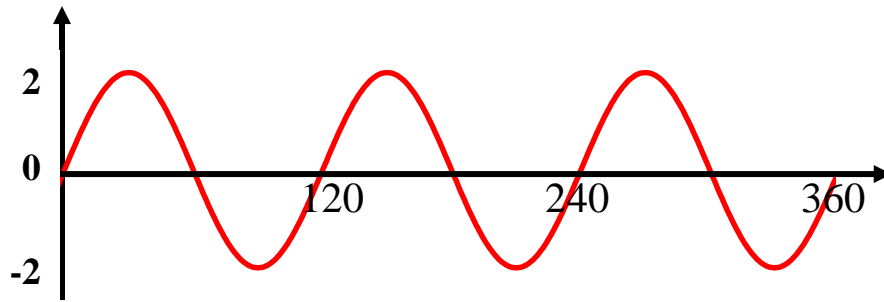
9. $x = -1, 8$

10. $(x - 8)(x + 1)$ so $x = -1, 8$

11. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{3 \pm \sqrt{(-3)^2 - 4(1)(-5)}}{2}$
 $x = \frac{3 \pm \sqrt{29}}{2}$
 $x = 4.19, -1.19$

Outcome 3 - You need 4 out of 6 to pass.

12.



13. $b = 3$

14. $6\cos x^\circ - 3 = 0$
 $6\cos x^\circ = 3$
 $\cos x^\circ = \frac{1}{2}$
 $x^\circ = 60 \text{ or } 360 - 60$
 $= 60, 300^\circ$