REVISION

CALCULATIONS: do **not** use a calculator and s**how all working**!

1. Evaluate:

(a) $8 \cdot 3 - 3 \cdot 64 + 2 \cdot 38$ (b) $10 \cdot 7 - 2 \cdot 6 \times 3$ (c) $18 \cdot 5 - 11 \cdot 6 \div 4$

(d) $\frac{3}{4} + \frac{2}{5} \times \frac{3}{8}$ (e) $\frac{4}{5} - \frac{2}{3}$ *of* $\frac{6}{7}$ (f) $\left(\frac{7}{12} - \frac{4}{9}\right) \div \frac{5}{6}$

TRANSPOSING FORMULAE: show each stage of the working carefully.

1. Change the subject of the formula to w:

(a) $t = fw - r$ (b) $v = 2aw - h$ (c) $u = r^2 - w$

(d) $s = \frac{w-2}{3}$ (e) $g = \frac{w-5}{n}$ (f) $v = \frac{3w+r}{2}$

2. Change the subject of the formula to r:

(a) $s = r^2 + t$ (b) $v = \frac{r^2 - h}{5}$ (c) $w = pr^2 - m$

(d) $x = (r-2)^2$ (e) $w = (r+n)^2$ (f) $t = (2r+c)^2$

(g) $h = \sqrt{r+n}$ (h) $w = \sqrt{r - at}$ (i) $g = \sqrt{r} - t$

3. Change the subject of the formula to t:

(a) $p = nt + 2t$ (b) $u = at - rt$ (c) $c = r^2 t + 2t$

FUNCTIONS: do **not** use a calculator and s**how all working**!

1. If $f(x) = 4x^2 - 13$ evaluate: (a) $f(1)$ (b) $f(3)$ (c) $f(-1)$ (d) $f(\frac{1}{2})$

2. If $g(t) = 12 - 4t^2$ evaluate: (a) $g(0)$ (b) $g(2)$ (c) $g(-2)$ (d) $g(\frac{3}{2})$

3. If $V(r) = \frac{12}{4-r}$, $r \neq 4$ evaluate: (a) $V(0)$ (b) $V(1)$ (c) $V(-2)$ (d) $V(6)$

4. If $P(n) = \frac{3n}{n+2}$, $n \neq -2$ evaluate: (a) $P(0)$ (b) $P(1)$ (c) $P(-1)$ (d) $P(-5)$

In each of the following find a , b and c.

5. $f(x) = 6x - 5$ (a) $f(a) = 19$ (b) $f(b) = -17$ (c) $f(c) = -3$

6. $g(t) = 20 - 4t$ (a) $g(a) = 8$ (b) $g(b) = 28$ (c) $g(c) = 18$

7. $V(r) = \frac{8}{3-r}$, $r \neq 3$ (a) $V(a) = 4$ (b) $V(b) = -4$ (c) $V(c) = 2$

8. $P(n) = \frac{4n}{n-3}$, $n \neq 3$ (a) $P(a) = 6$ (b) $P(b) = -2$ (c) $P(c) = 3$

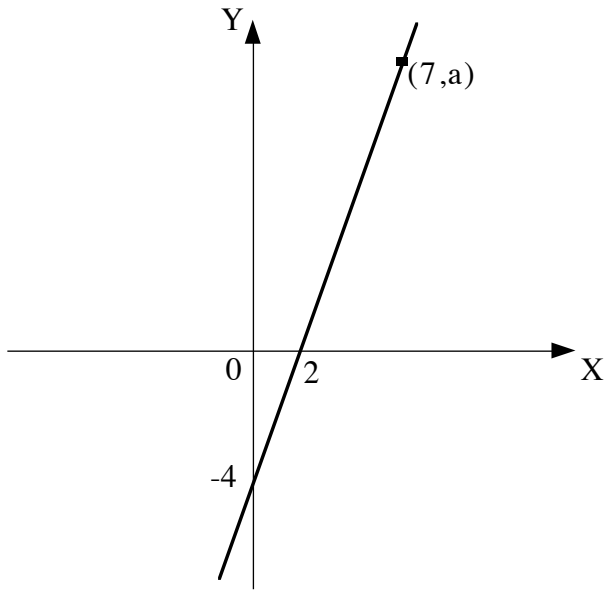
Write expressions for each of the following, leaving your answers in simplest form.

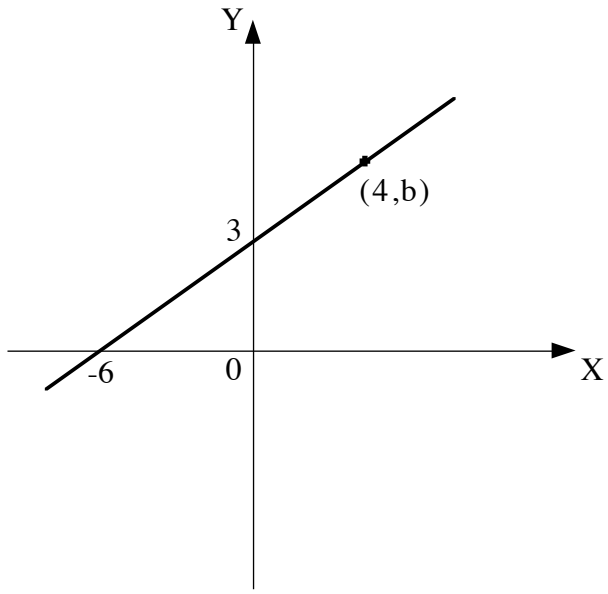
9. If $f(x) = x^2 - 4x$ (a) $f(-a)$ (b) $f(-a) - f(a)$

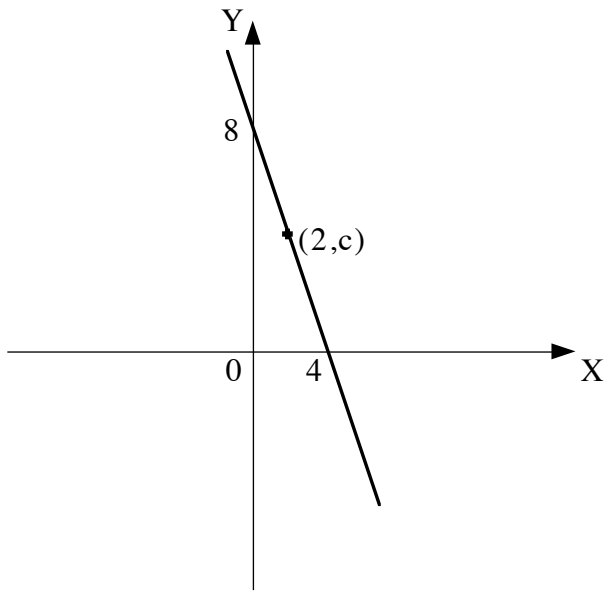
10. If $f(x) = x^2 - 2x$ (a) $f(a+2)$ (b) $f(a+2) - f(a)$

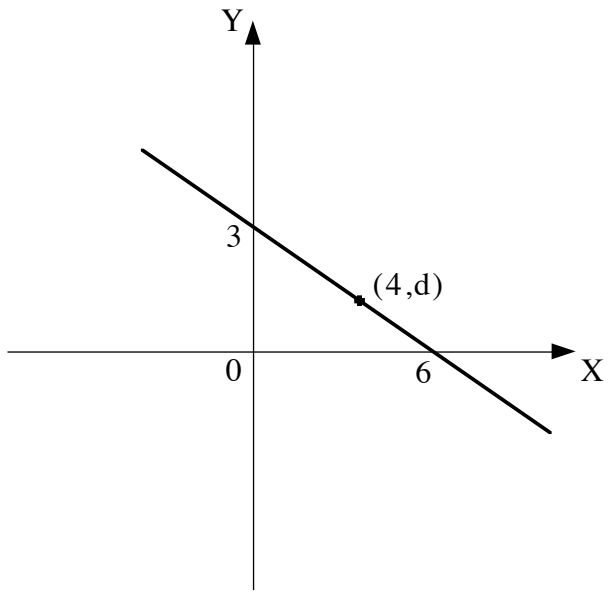
STRAIGHT LINE

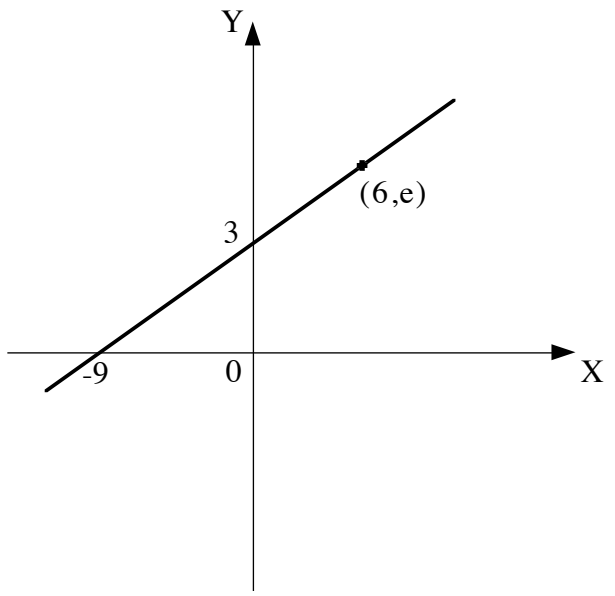
1. In each of the following graphs the points where the line meets the axes are shown.
For each graph find the equation of the line and **use the equations** to find the value of a, b, c etc.

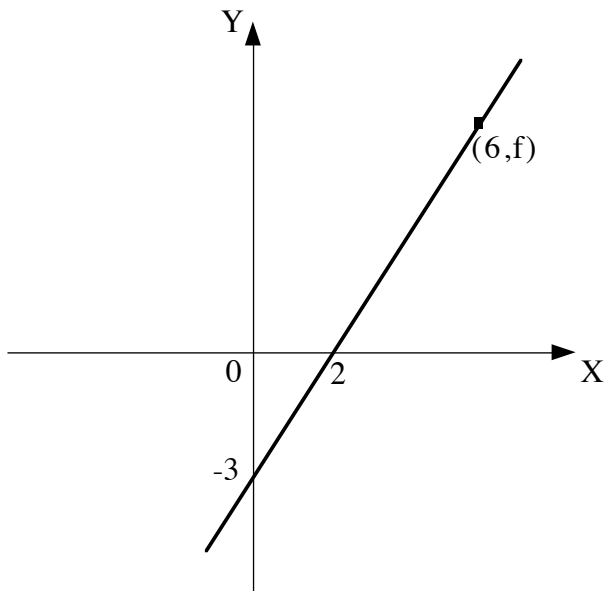




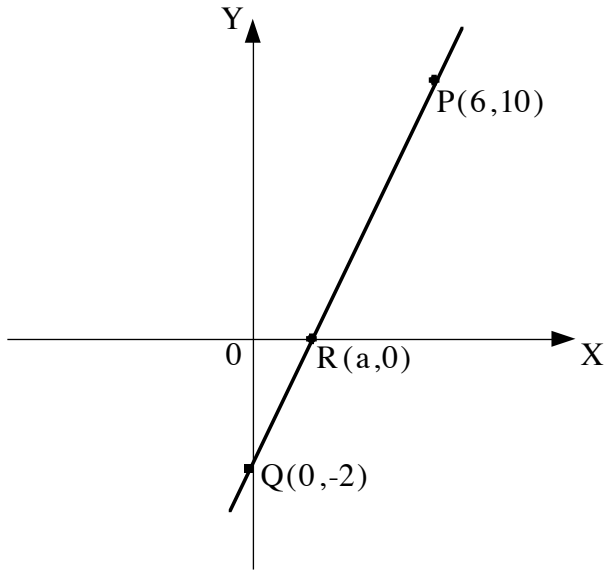


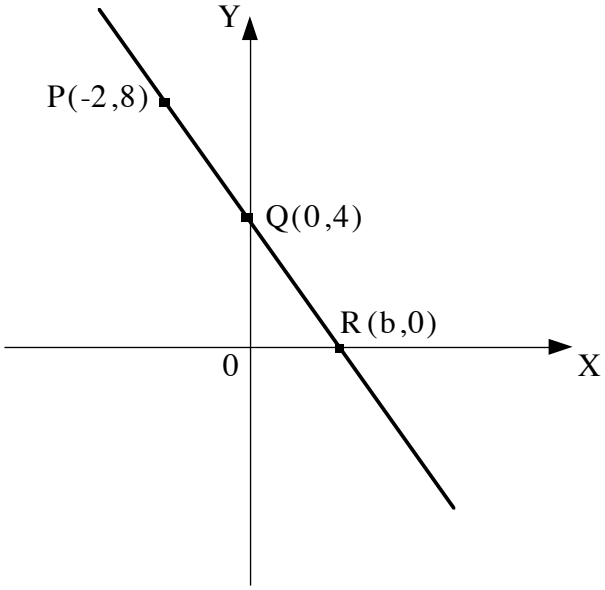






2. For each graph find the equation of the line passing through the points P and Q and **use the equations** to find the values of a and b.





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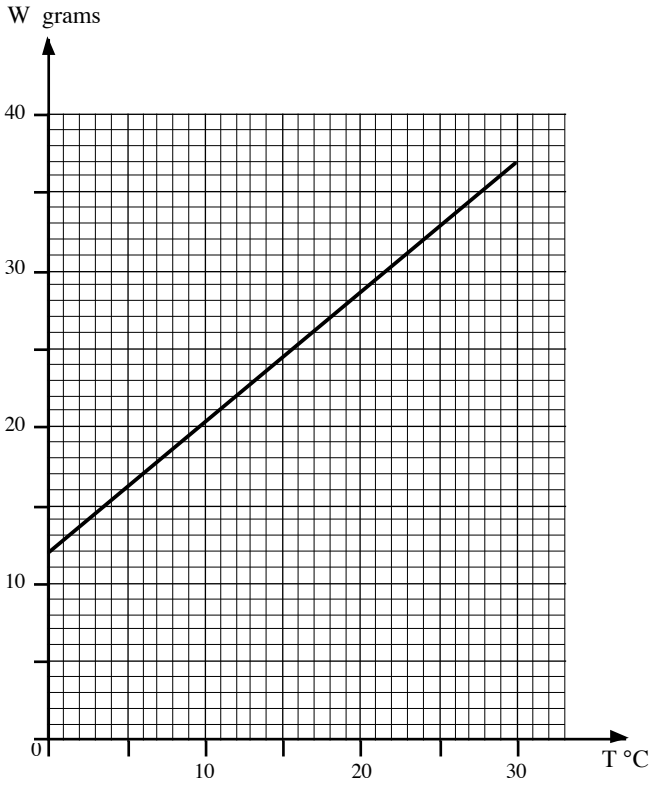


A salt is dissolved in a litre of solvent.

The amount of salt that dissolves is measured at different temperatures and a graph drawn.

The graph is a straight line and shows the mass of salt that dissolves at a particular temperature.

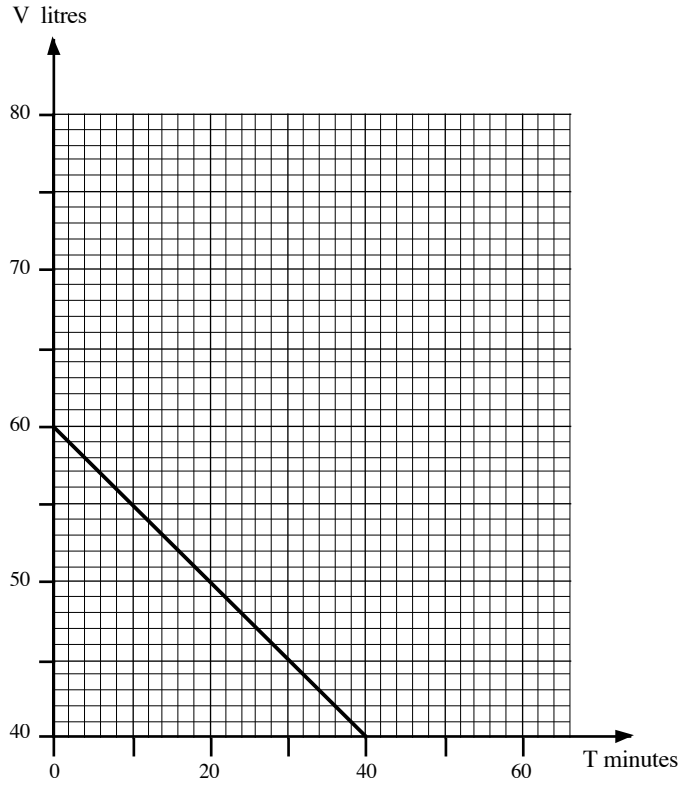
(a) The equation of the graph is of the form

$$W = mT + c$$

Find the equation of the graph.

(b) **Use the equation** to calculate the mass of salt that will dissolve at 48 °C.

4.



A container is full of water.

Water leaks from the container at a regular rate and the volume remaining is recorded over time.

The graph drawn using the recorded results is a straight line.

(a) The equation of the graph is of the form

$$V = mT + c$$

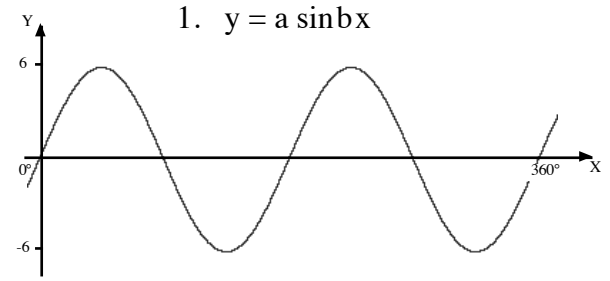
Find the equation of the graph.

(b) **Use the equation** to calculate the time it takes for the container to empty.

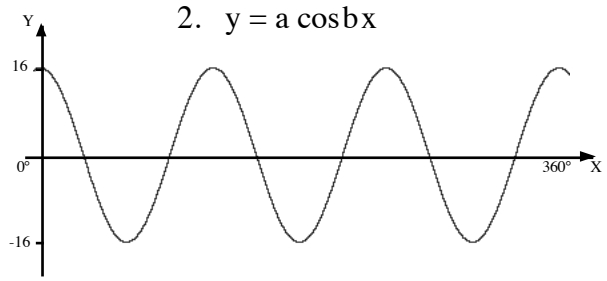
TRIG. GRAPHS:

The general form of the equation of the graphs are given. Write the equations of the graphs.

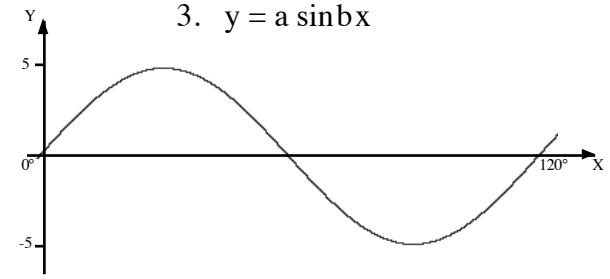
1. $y = a \sin bx$



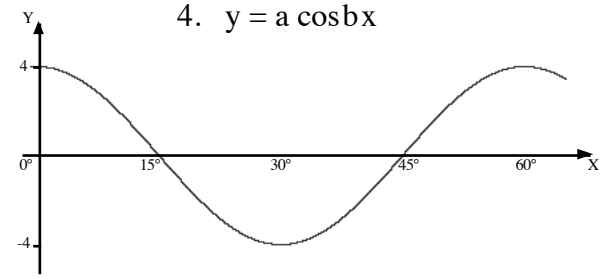
2. $y = a \cos bx$



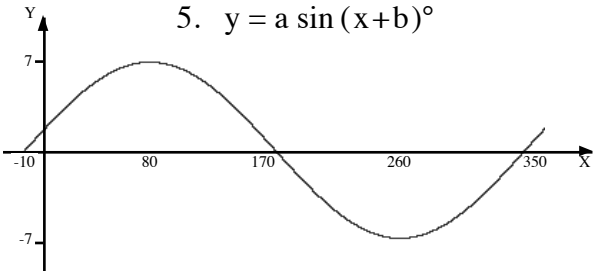
3. $y = a \sin bx$



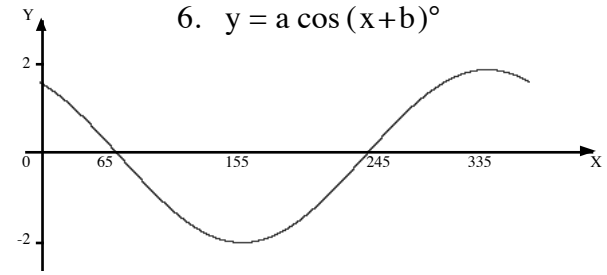
4. $y = a \cos bx$



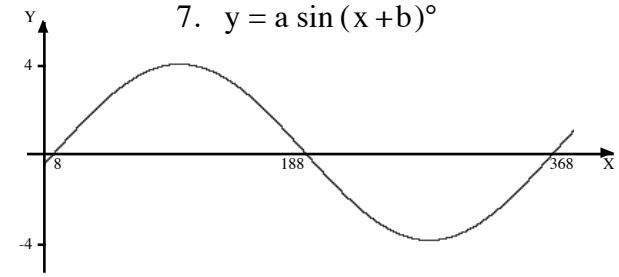
5. $y = a \sin (x+b)°$



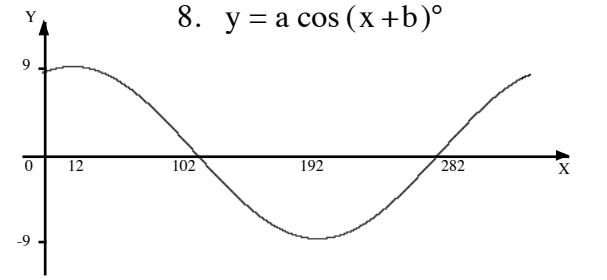
6. $y = a \cos (x+b)°$



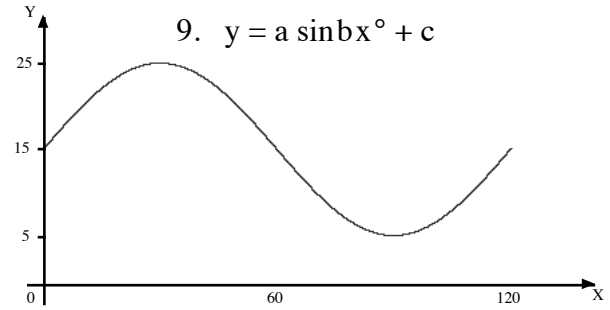
7. $y = a \sin (x+b)°$



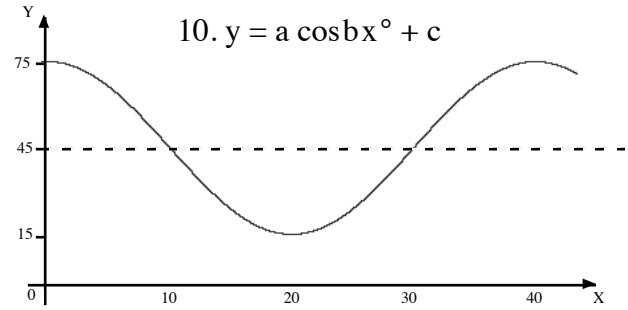
8. $y = a \cos (x+b)°$



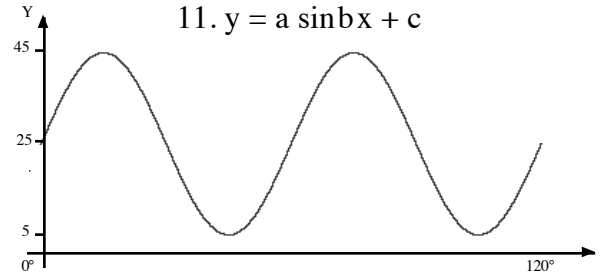
9. $y = a \sin bx° + c$



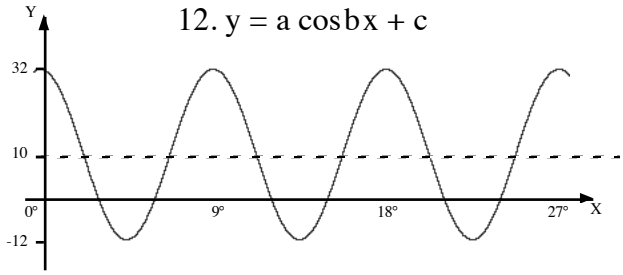
10. $y = a \cos bx° + c$



11. $y = a \sin bx + c$



12. $y = a \cos bx + c$



ANSWERS

CALCULATIONS

1. (a) 7·04 (b) 2·9 (c) 15·6 (d) $^{9}/_{10}$ (e) $^{8}/_{35}$ (f) $^{1}/_{6}$

TRANSPOSING FORMULAE

1. (a) $w = \dfrac{t+r}{f}$ (b) $w = \dfrac{v+h}{2a}$ (c) $w = r^2 - u$

   (d) $w = 3s + 2$ (e) $w = ng + 5$ (f) $w = \dfrac{2v - r}{3}$

2. (a) $r = \sqrt{s-t}$ (b) $r = \sqrt{5v+h}$ (c) $r = \sqrt{\dfrac{w+m}{p}}$

   (d) $r = \sqrt{x} + 2$ (e) $r = \sqrt{w} - n$ (f) $r = \dfrac{\sqrt{t} - c}{2}$

   (g) $r = h^2 - n$ (h) $r = w^2 + at$ (i) $r = (g+t)^2$

3. (a) $t = \dfrac{p}{n+2}$ (b) $t = \dfrac{u}{a-r}$ (c) $t = \dfrac{c}{r^2+2}$

FUNCTIONS

1.	(a) -9	(b) 23	(c) -9	(d) -12
2.	(a) 12	(b) -4	(c) -4	(d) 3
3.	(a) 3	(b) 4	(c) 2	(d) -6
4.	(a) 0	(b) 1	(c) -3	(d) 5
5.	(a) 4	(b) -2	(c) $^{1}/_{3}$	
6.	(a) 3	(b) -2	(c) $^{1}/_{2}$	
7.	(a) 1	(b) 5	(c) -1	
8.	(a) 9	(b) 1	(c) -9	
9.	(a) $a^2 + 4a$	(b) $8a$		
10.	(a) $a^2 + 2a$	(b) $4a$		

STRAIGHT LINE

1. (a) $y = 2x - 4$; $a = 10$ (b) $y = {}^{1}/_{2}x + 3$; $b = 5$ (c) $y = -2x + 8$; $c = 4$

   (d) $y = -{}^{1}/_{2}x + 3$; $d = 1$ (e) $y = {}^{1}/_{3}x + 3$; $e = 5$ (f) $y = {}^{3}/_{2}x - 3$; $f = 6$

2. (a) $y = 2x - 2$; $a = 1$ (b) $y = -2x + 4$; $b = 2$

3. (a) $W = {}^{5}/_{6}T + 12$ (b) 52 grams

4. (a) $V = -{}^{1}/_{2}T + 60$ (b) 120 minutes

TRIG. GRAPHS

1. $y = 6\sin 2x$ 2. $y = 16\cos 3x$ 3. $y = 5\sin 3x$
4. $y = 4\cos 6x$ 5. $y = 7\sin(x+10)°$ 6. $y = 2\cos(x+25)°$
7. $y = 4\sin(x-8)°$ 8. $y = 9\cos(x-12)°$ 9. $y = 10\sin 3x° + 15$
10. $y = 30\cos 9x° + 45$ 11. $y = 20\sin 6x + 25$ 12. $y = 22\cos 40x + 10$