

S2 END OF YEAR TEST REVISION

Patterns

1. A box contains 5 pancakes.

(a) **COPY** and complete the table :-

No. of boxes (B)	1	2	3	4	5	6
No. pancakes (P)	5	10	15	?	?	?

$\underbrace{\quad\quad\quad}_?$
 $\underbrace{\quad\quad\quad}_?$
 $\underbrace{\quad\quad\quad}_?$



(b) **COPY** and complete :- " number of pancakes = x number of boxes ".

(c) Write down a formula using symbols to show this ($P = \dots \times \dots$).

(d) Use your formula to find the number of pancakes in 15 boxes.

2. This table shows the cost of hiring a motor cycle for several days.

No. of Days hired (D)	1	2	3	4	5	6
Cost in £'s (C)	12	20	28	?	?	?

$\underbrace{\quad\quad\quad}_?$
 $\underbrace{\quad\quad\quad}_?$
 $\underbrace{\quad\quad\quad}_?$



(a) How much will it cost to hire a motor cycle for (i) 6 days (ii) 1 week ?

(b) How much **extra** does it cost for each additional day of hire ?

(c) Write down the formula for determining the cost of hiring the motor cycle.

$$C = ? \times D + ?$$

(d) How much will it cost to hire a motor cycle for 10 days ?

(e) Mrs Able paid £116 to hire a motor cycle. For how many days had she hired it ?

3. **COPY** and complete both tables and determine a formula or rule connecting the two letters :-

(a)

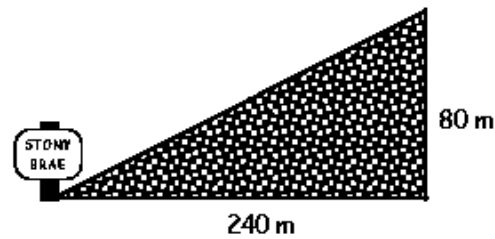
breadth (b)	1	2	3	4
Area (A)	11	20	29

(b)

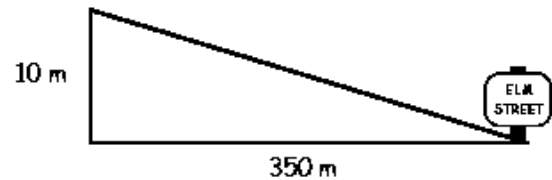
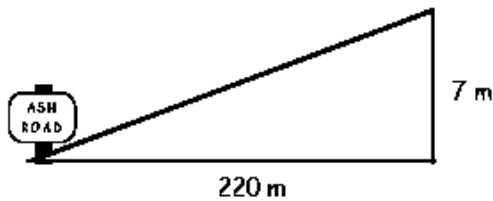
g	2	4	6	8
H	30	80	130

Straight Line

1. a Write down the gradient of Stony Brae as a fraction.
 b Simplify the fraction.



2. a Calculate the gradients of Ash Road and Elm Street.

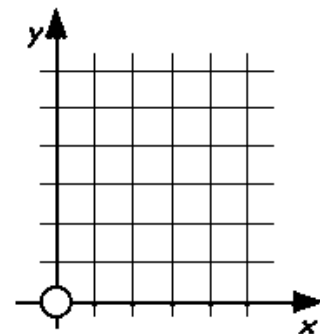


- b Now change your answers to decimals, (3 decimal places).
 c Which of the 2 streets is steeper?

3. a Copy and complete the table for the line $y = 6x$.

x	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2
$y = 6x$					

- b List the coordinates of the 5 points.
 c Draw a set of axes as shown, plot the 5 points and join them up to show the line $y = 6x$.



4. Copy the table below, list the coordinates of the points, draw a set of axes and draw the line $y = -\frac{1}{3}x$ on it.

x	0	3	6	9
$y = -\frac{1}{3}x$				

5. a Complete the table for the line $y = 3x - 2$.

x	0	1	2	3
$y = 3x - 2$				

- b List the coordinates of the 4 points.
 c Draw a set of axes and show the line $y = 3x - 2$.

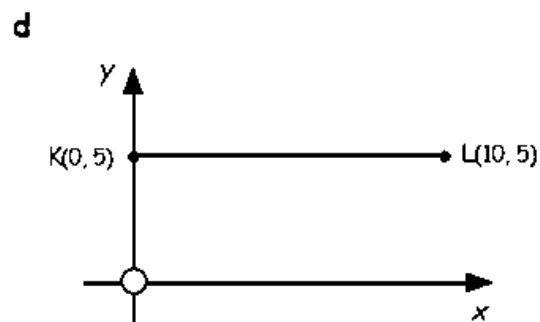
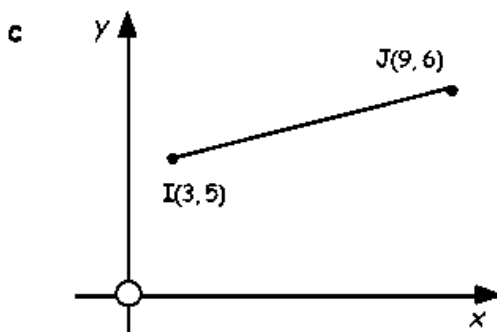
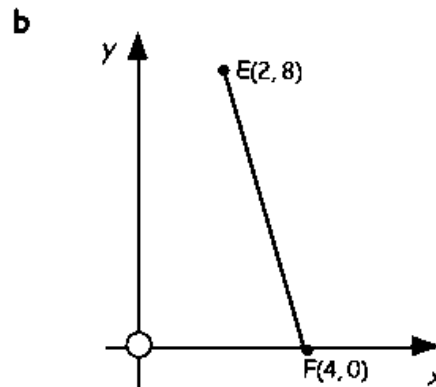
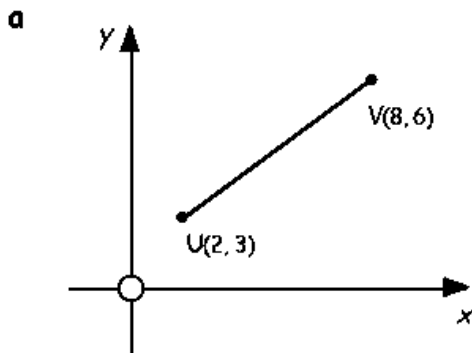
6. a Complete the table for the line $y = 4x - 1$.

x	-2	-1	0	1	2
$y = 4x - 1$					

- b List the coordinates of the 5 points.
 c Draw a set of axes and show the line $y = 4x - 1$.

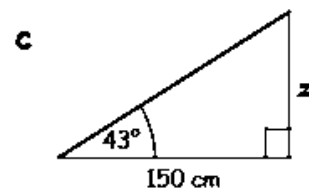
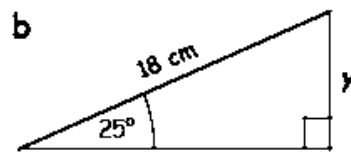
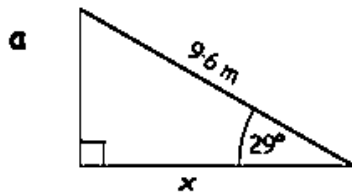
7. Copy each of the following diagrams accurately onto squared paper.

Calculate the gradient of each line :-

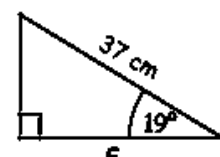
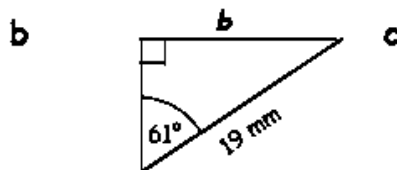
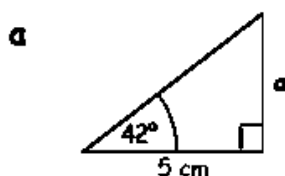


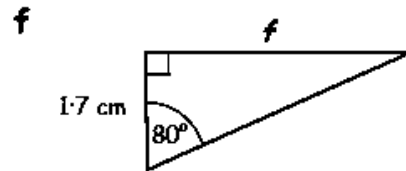
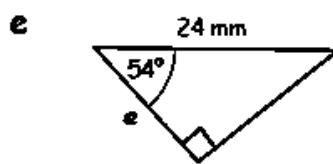
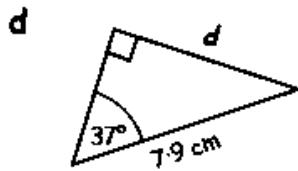
Trigonometry

1. Use "cosine" to calculate the value of x and "sine" to calculate the value of y and "tangent" to calculate the value of z .

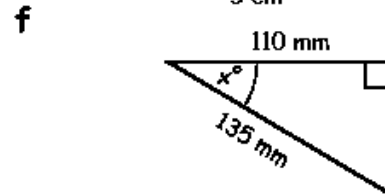
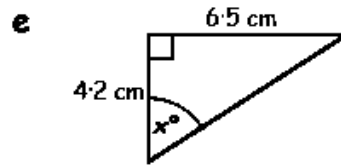
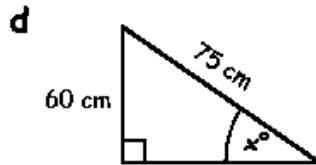
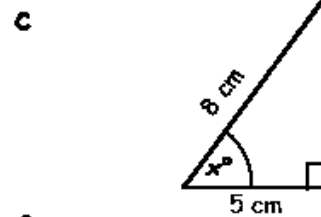
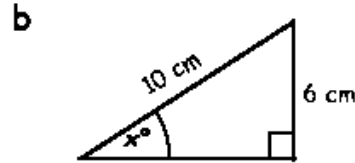
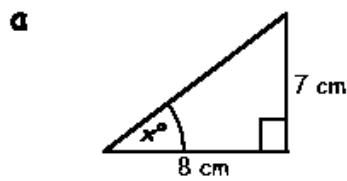


2. In each of the following, decide which of the 3 ratios (sin, tan, cos) to use and then find the values of a , b , c , ...



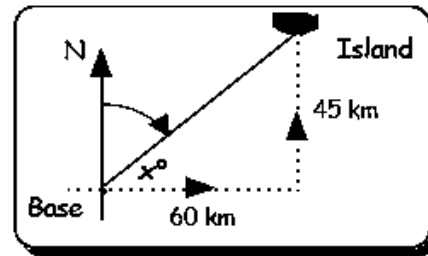


3. Calculate the size of each of the following angles (remember to use "2" buttons) :-

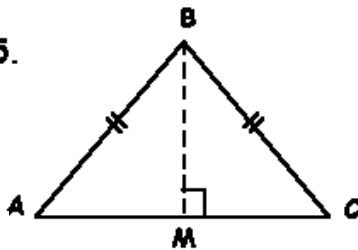


4. To get to an island from an air base, a pilot flies 60 km East, then 45 km North.

- a** Calculate the size of the angle x .
b Write down the 3 figure bearing of the island from the base.



5. $\triangle ABC$ is isosceles with $AB = BC = 17$ cm and $AC = 22$ cm.



- a** Write down the length of the line MC .
b Calculate the size of $\angle BCM$.

Equations and Inequations

1. Find the value of x in the following equations (Show each step of working carefully).

(a) $x + 5 = 19$

(b) $x - 40 = 10$

(c) $9x = 54$

(d) $2x = 17$

(e) $10x = 5$

(f) $4x + 1 = 21$

(g) $9x - 6 = 30$

(h) $2x + 7 = 14$

(i) $3x - 2 = -11$

(j) $5x + 1 = 3x + 7$

(k) $7x - 1 = 4x + 14$

(l) $9x = 3x + 42$

2. Solve these equations :-

(a) $3(x + 5) = 36$

(b) $8(x - 3) = 40$

(c) $2(3x + 1) = 38$

(d) $9(2x - 8) = 0$

(e) $5(3x - 2) = 5x$

(f) $8(2x - 1) = 4x + 16$

(g) $8(x + 2) - 6x = 21$

(h) $5(2x - 1) + 3(1 + x) = 37$

3. Multiply each term by the l.c.m. of the denominators to dispose of the fractions and solve :-

(a) $\frac{1}{2}x - 5 = 4$

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

(c) $\frac{x+2}{5} - 2 = 0$

(d) $\frac{x-1}{4} - \frac{x+1}{10} = 1$

4. Solve the following inequalities :-

(a) $x + 8 > 11$

(b) $x - 12 \leq 12$

(c) $x - 32 \geq 0$

(d) $4x < 64$

(e) $2x + 18 > 24$

(f) $3(2x + 1) \leq 33$

(g) $3(2x - 4) \geq 5x + 17$

(h) $2(3x + 1) < 4x - 2$

(i) $6(2x - 4) \leq 9x$

Factorising

1. Copy and factorise :-

(a) $3a + 6 = 3(\dots + \dots)$ (b) $8g - 20 = 4(\dots - \dots)$ (c) $10y + 25x = 5(\dots + \dots)$

(d) $ab + 4a = a(\dots + \dots)$ (e) $2kg + 2kp = 2k(\dots + \dots)$ (f) $6b + 9b^2 = 3b(\dots + \dots)$.

2. Factorise :-

(a) $2a + 4$

(b) $3x + 12$

(c) $5k - 40$

(d) $6p + 6q$

(e) $12x + 15$

(f) $16y + 24$

(g) $24k - 15$

(h) $9a + 21b$

(i) $3x + 9y + 6$

(j) $4d + 6e + 10f$

(k) $12w + 30h - 18$

(l) $15q - 45p + 75m$.

3. Factorise fully :-

(a) $3ab + 21b$

(b) $12cd + 15c$

(c) $30pqr - 24pq$

(d) $5x - 15xy + xz$

(e) $x^2 + 4x$

(f) $3y^2 + 6y$

(g) $8x^2 + 4x$

(h) $12y - y^2$

(i) $x^2 + x$

(j) $12x^2 + 4x$

(k) $x^3 + x$

(l) $y^3 + y^2 + y$.

Brackets

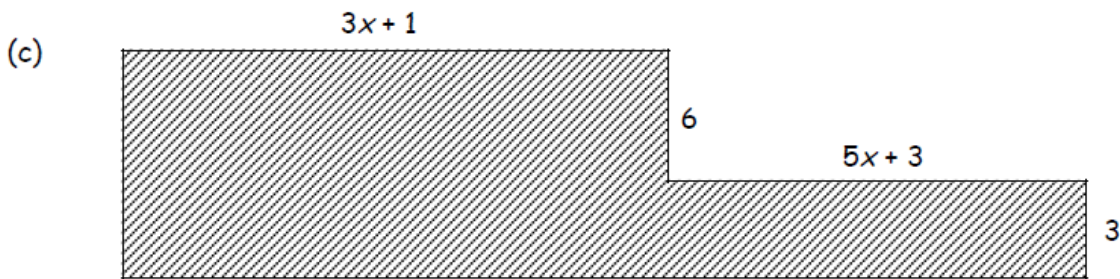
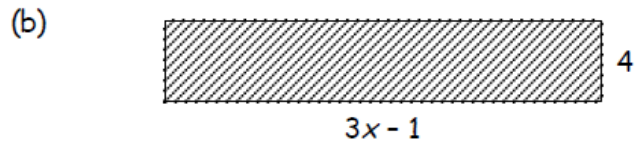
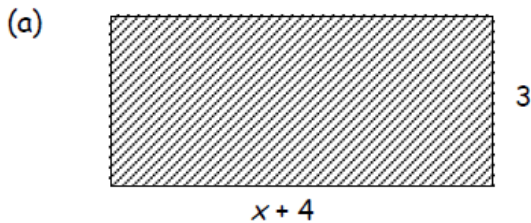
1. Multiply out the brackets :-

- (a) $3(x + 2)$ (b) $4(t + 4)$ (c) $5(a - 1)$ (d) $10(w - 2)$
(e) $2(2a + 1)$ (f) $3(4e + 5)$ (g) $7(2g - 1)$ (h) $9(5k - 3)$
(i) $3(2a + b)$ (j) $5(x + 2y)$ (k) $8(2h + 4g - 1)$ (l) $15(v - 3w + y - 5)$.

2. Remove these brackets :-

- (a) $-2(a + 3)$ (b) $-5(6 + 2c)$ (c) $-3(5 - 4g)$ (d) $-(4a - 6)$
(e) $x(x + 4)$ (f) $t(2t - 5)$ (g) $-p(5p + 2)$ (h) $-k(-3 + 6k - m)$
(i) $2y(3y + 1)$ (j) $4x(3x - 7)$ (k) $-2w(7 + 3w)$ (l) $-4p(6p - 2 + k)$.

3. Find the areas of each shape below :-



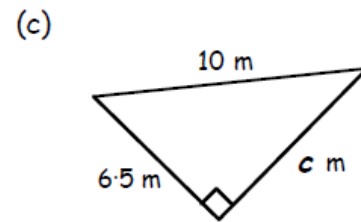
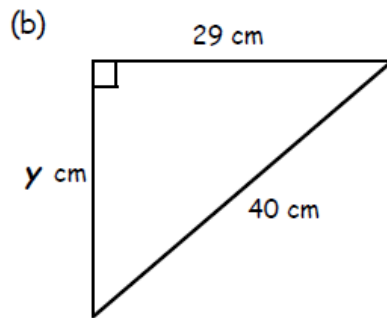
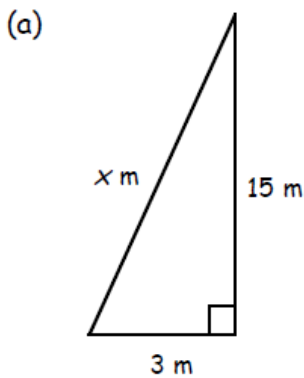
Multiply out the brackets and simplify :-

- 4 (a) $2(x + 3) + 1$ (b) $3(y + 4) + 5$ (c) $7(k - 1) + 10$
(d) $5(t - 2) - 5$ (e) $3(2g + 4) + 8$ (f) $6(3x + 1) - 6$
(g) $8(3e - 2) + 5$ (h) $9(4h + 7) - 60$ (i) $4(w + 1) - 4w$.
- 5 (a) $2(f + 3) + 3(f + 1)$ (b) $4(y + 2) + 7(y + 1)$ (c) $6(b + 3) + 2(b - 5)$
(d) $5(2g + 2) + 4(g - 3)$ (e) $7(p + 3) - 5(p + 1)$ (f) $7(2q + 3) - 4(3q - 5)$
(g) $5(3m - 2) + 3(2m - 6)$ (h) $4(3p - 4) - 3(4p - 5)$ (i) $5u(2u + 3) - 2u(u - 7)$.
- 6 (a) $5 - 4(y + 2)$ (b) $12 - 3(2b + 4)$ (c) $6 - 3(2u - 2)$
(d) $6m - 2(4 + 3m)$ (e) $3h - 5(2h - 1) + 6h$ (f) $r - (r - 1) + (-1)$.

Pythagoras

1. Find :- (a) 8^2 (b) 100^2 (c) $\sqrt{100}$ (d) $\sqrt{12}$.

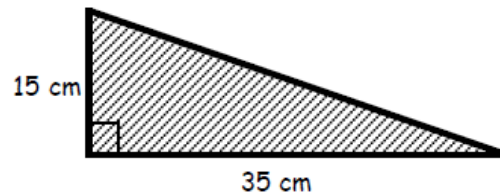
2. Calculate the length of each missing side :-



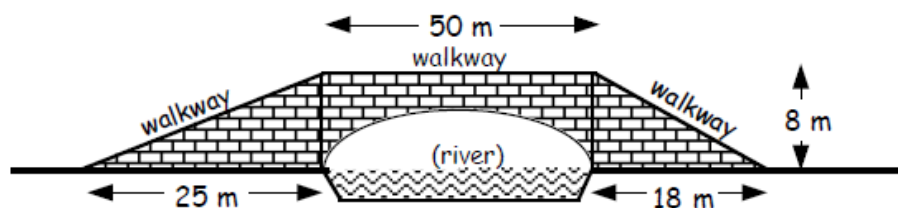
3. A triangular car window frame needs a rubber seal around its perimeter.

Find the perimeter of the window.

(Give your answer to the nearest millimetre).



4. A design for a bridge walkway over a river is as shown.



The architect has been given instructions that the **total** walkway length must not exceed 100 metres.

Has the architect designed the bridge properly ?

(Explain your answer in full showing all working).

5. The **area** of the triangle shown is 75 cm^2 .

Find the length of the sloping side.

