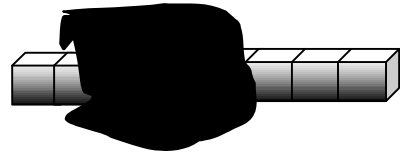


SAT REVISION; Non Calculator

ALL LEVELS.

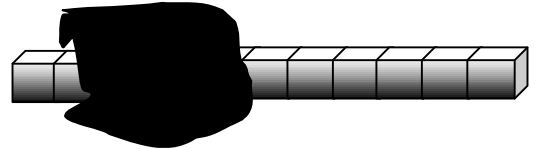
- 1) Jenny is holding a row of cubes.
You cannot see how many cubes she is holding.



Call the number of cubes she is holding n .

- a) She joins on three more cubes.

Write an expression for the total number of cubes she is holding now.



- b) Jenny starts again with n cubes. One cube is removed.
Write an expression for the total number of cubes she is holding now.

- c) Jenny starts again with n cubes. Another row of the same length is added.
Write an expression for the total number of cubes she is holding now.

- 2) Here are some algebra cards.

$$\boxed{n - 3}$$

$$\boxed{n \div 3}$$

$$\boxed{n + 3}$$

$$\boxed{n^3}$$

$$\boxed{3n}$$

$$\boxed{n^2 + n}$$

$$\boxed{2n + 1}$$

$$\boxed{2n + n}$$

- a) One of the cards will always give the same answer as $\frac{n}{3}$ Which card is it ?

- b) One of the cards will always give the same answer as $n \times n \times n$ Which card is it ?

- c) Two of the cards will always give the same answer as $3 \times n$ Which cards are they ?

- 3) Look at these numbers: $+4, -2, 0, +7, +5, -4, -8, +1$.

Use numbers from the above list to complete the following sums.

a) $\boxed{+1} + \boxed{-4} + \boxed{} = 4$.

b) $\boxed{+4} + \boxed{-2} + \boxed{} = 6$.

- 4) A shop sells batteries at a price of 65 pence each.

- a) Find the price of 16 such batteries. **Show your working.**

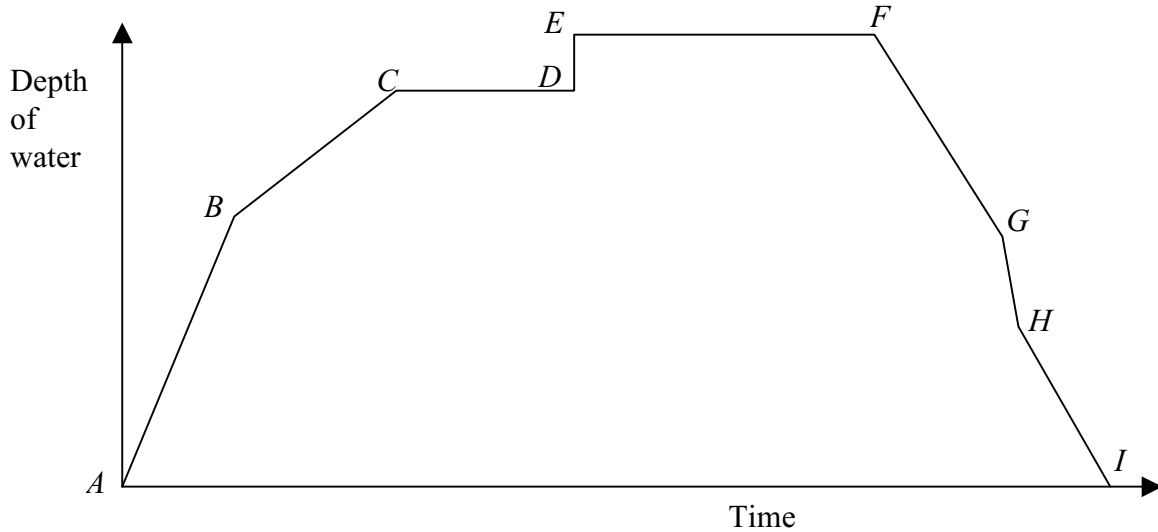
- b) Mr. Phillips has £5.90 to spend on batteries. Work out the maximum number of batteries Mr. Phillips can buy. **Show your working.**

- 5) Freddy has these four number cards. $\boxed{4} \quad \boxed{6} \quad \boxed{2} \quad \boxed{8}$ The mean is 5.

Freddy takes another card. $\boxed{4} \quad \boxed{6} \quad \boxed{2} \quad \boxed{8} \quad \boxed{?}$ The mean of the five cards is now 6.

What number is on his new card ?

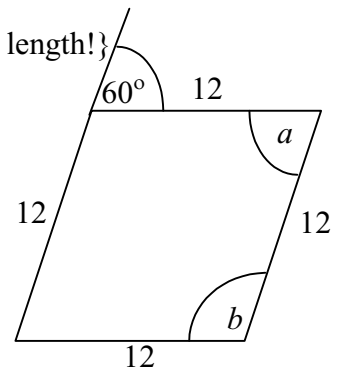
6) A child is having a bath. The simplified graph shows the depth of water in the bath.



- a) From *A* to *B* both taps are turned full on. What might be happening at point *B* ?
- b) Which part of the graph shows the child getting into the bath ?
- c) Which part of the graph shows the child getting out of the bath ?

7) a) Kerry draws a rhombus. {Opposite sides are parallel, all 4 sides of equal length!}

Calculate angles *a* and *b*.



b) Kerry types the instructions to draw a regular pentagon:
repeat 5 [forward 12, left turn 72]

Copy and complete the instructions to draw a regular hexagon:
repeat 6 [forward 12, left turn].

8) This is what a pupil wrote.

Show that the pupil was wrong.

For all numbers *t* and *w*,

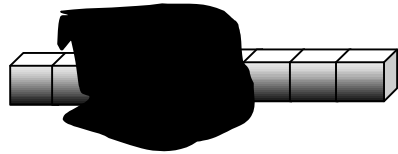
$$\frac{1}{t} + \frac{1}{w} = \frac{2}{t + w}$$

9) All of the following calculations have the answer 50.

Fill in each missing number.

- a) $25 \times 2 = 50$ b) $50 \div 1 = 50$
- $12.5 \times \dots = 50$ c) $5 \div \dots = 50$.

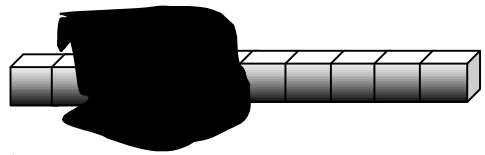
- 10) Jenny is holding a row of cubes.
You cannot see how many cubes she is holding.



Call the number of cubes she is holding n .

- a) She joins on two more cubes.

Write an expression for the total number of cubes she is holding now.



- b) Jenny starts again with n cubes. Two cubes are removed.
Write an expression for the total number of cubes she is holding now.

- c) Jenny starts again with n cubes. Two further rows of the same length are added.
Write an expression for the total number of cubes she is holding now.

- 11) Here are some algebra cards.

$$n - 2$$

$$n \div 2$$

$$n + 2$$

$$n^2$$

$$2n$$

$$n + n$$

$$n + 1$$

$$2n + n$$

- a) One of the cards will always give the same answer as $\frac{n}{2}$ Which card is it ?
- b) One of the cards will always give the same answer as $n \times n$ Which card is it ?
- c) Two of the cards will always give the same answer as $2 \times n$ Which cards are they ?

- 12) Look at these numbers: $+3, 0, -5, +9, +2, -8, +7, -2$.

- a) Choose a number from the above list to give the lowest possible answer.

$$\boxed{-2} + \boxed{} = \dots\dots\dots$$

- b) Choose a number from the above list to give the lowest possible answer.

$$\boxed{-2} - \boxed{} = \dots\dots\dots$$

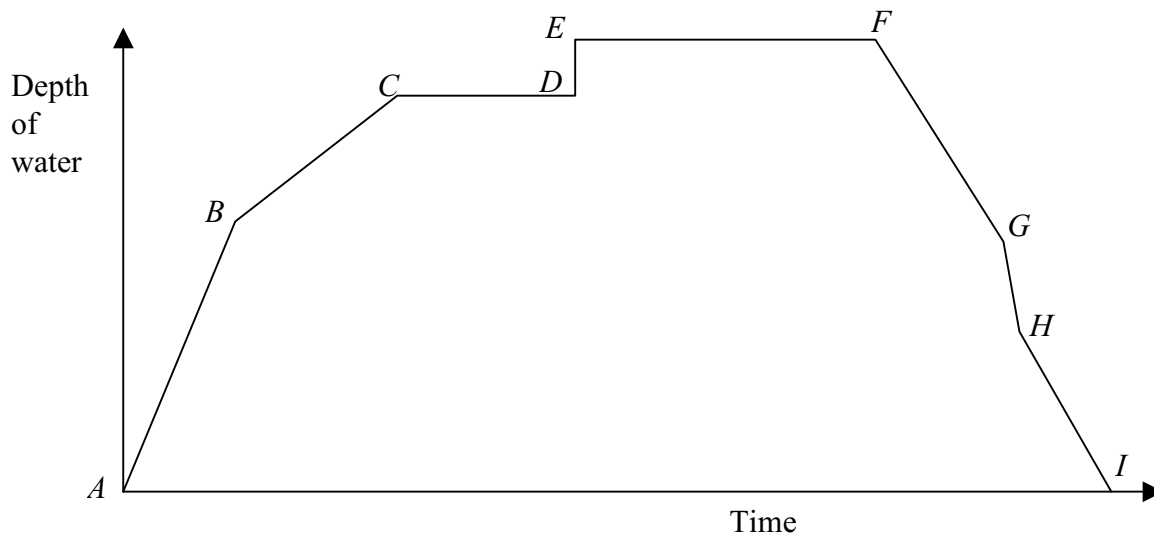
- 13) A shop sells plants at a price of 85 pence each.

- a) Find the price of 16 such plants. **Show your working.**
b) Mr. Phillips has £5.90 to spend on plants. Work out the maximum number of plants Mr. Phillips can buy. **Show your working.**

- 14) Freddy has these four number cards. $\boxed{3} \quad \boxed{5} \quad \boxed{4} \quad \boxed{12}$ The mean is 6.

Freddy takes another card. $\boxed{3} \quad \boxed{5} \quad \boxed{4} \quad \boxed{12} \quad \boxed{?}$ The mean of the five cards is now 7.
What number is on his new card ?

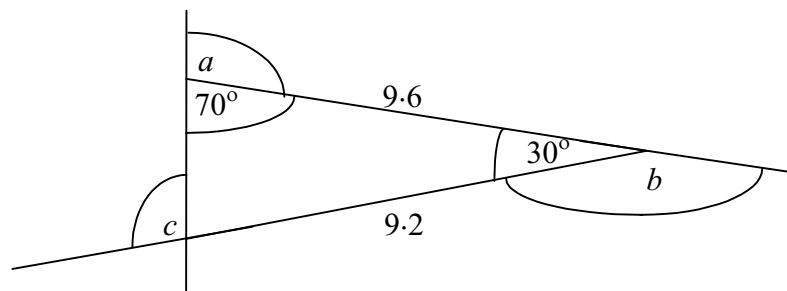
15) A child is having a bath. The simplified graph shows the depth of water in the bath.



- a) From *A* to *B* both taps are turned full on. What might be happening at point *B* ?
- b) What is happening between points *E* and *F* ?
- c) What might be happening between points *F* and *G* ?

16) a) Kerry draws a triangle.

Calculate angles *a*, *b* and *c*.

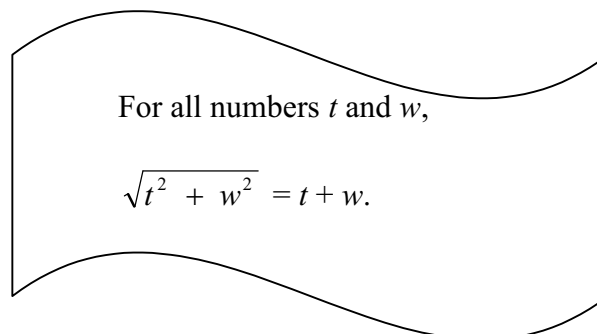


b) Kerry types the instructions to draw a regular pentagon:
repeat 5 [forward 12, left turn 72]

Copy and complete the instructions to draw a regular octagon:
repeat 8 [forward 12, left turn].

17) This is what a pupil wrote.

Show that the pupil was wrong.



18) All of the following calculations have the answer 60.

Fill in each missing number.

- a) $2.4 \times 25 = 60$
- b) $60 \div 1 = 60$
- $0.24 \times \dots = 60$
- $6 \div \dots = 60.$

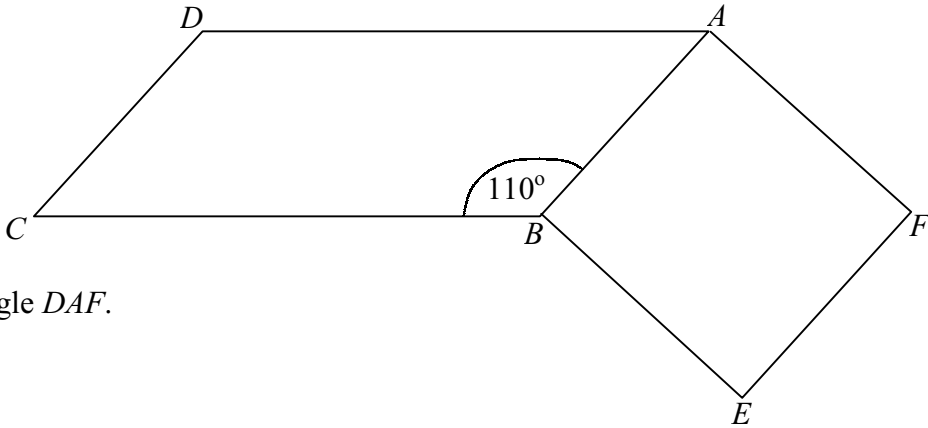
ANSWERS.

- 1) a) $n + 3$, b) $n - 1$, c) $2n$.
- 2) a) $n \div 3$, b) n^3 , c) $3n$ and $2n + n$.
- 3) a) Missing number = 7, b) Missing number = 4.
- 4) a) £10.40, b) 9 batteries.
- 5) 10.
- 6) a) One of the taps is turned off, b) between D and E,
c) between G and H.
- 7) a) $a = 60^\circ$, $b = 120^\circ$, b) repeat 6 [forward 12, left turn 60]
- 8) For example, put $t = 1$ and $w = 1$, then $\frac{1}{t} + \frac{1}{w} = \frac{1}{1} + \frac{1}{1} = 1$, whilst $\frac{2}{t+w} = \frac{2}{1+1} = 2$ and so the pupil is wrong.
- 9) a) $12.5 \times 4 = 50$, b) $5 \div 0.1 = 50$.
- 10) a) $n + 2$, b) $n - 2$, c) $3n$.
- 11) a) $n \div 2$, b) n^2 , c) $2n$ and $n + n$.
- 12) a) Missing number = -8 , b) Missing number = 9.
- 13) a) £13.60, b) 6 plants.
- 14) 11.
- 15) a) One of the taps is turned off, b) the water level is unchanging, the child is in the bath,
c) the plug has been pulled and water is running out.
- 16) a) $a = 110^\circ$, $b = 150^\circ$, $c = 100^\circ$, b) repeat 8 [forward 12, left turn 45]
- 17) For example, put $t = 1$ and $w = 1$, then $\sqrt{1^2 + 1^2} = \sqrt{2}$ whilst $t + w = 1 + 1 = 2$ and so the pupil is wrong.
- 18) a) $0.24 \times 250 = 60$, b) $6 \div 0.1 = 60$.

LEVELS 6-8 NON CALCULATOR

- 1) a) Write down two negative numbers x and y such that $x - y = 6$.
 b) Write down two negative numbers x and y such that $x - y = -4$.

- 2) $ABCD$ is a parallelogram and $ABEF$ is a square. Angle $ABC = 110^\circ$.



Find angle DAF .

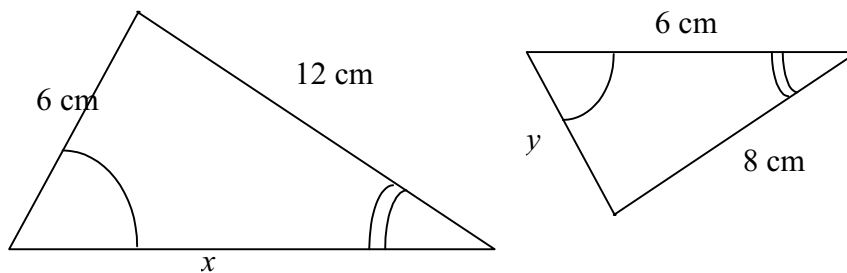
- 3) Rearrange the following equations to make e the subject. **Simplify your answers as far as possible.**

i) $p = 5(e + f)$, ii) $p = 5(f - e)$, iii) $3e + p = 5(p - e)$, iv) $3(2e - a) = 2e + a$.

- 4) Rearrange the following equations to make d the subject.

i) $r = \frac{1}{3}(c + d)$, ii) $r = \frac{1}{4}(2c - d)$, iii) $r = \frac{2}{3}(c - d)$.

- 5)



The 2 triangles drawn are similar. Calculate the lengths of x and y .

- 6) I have a bag that contains blue, red, green and yellow counters.

I am going to take out one counter at random. The table shows the probability of each colour being taken out.

	Blue	Red	Green	Yellow
Probability	0.25	0.05	0.4	0.3

- a) Explain why the number of **green** counters in the bag **cannot** be 20.
 b) What is the smallest number of each colour in the bag?

ANSWERS.

2) 160° .

3) i) $e = \frac{p-5f}{5}$, ii) $e = \frac{5f-p}{5}$, iii) $e = \frac{p}{2}$, iv) $e = a$.

4) i) $d = 3r - c$, ii) $d = 2c - 4r$, iii) $d = \frac{2c-3r}{2}$.

5) {Scale factor = 1.5} $x = 9$ cm, $y = 4$ cm.

6) a) Since there are 8 times as many greens as reds in the bag, if there were 20 greens then there would be 2.5 reds. b) Blue = 5, red = 1, green = 8, yellow = 6.

7) a) $\frac{1}{18}$, b) $\frac{1}{324}$.

8) 1 : 1.

9) 1 : 2.

WRITE YOUR ANSWERS
UPON THESE SHEETS.

LEVELS 6 to 8 TEST NON CALCULATOR

NAME:

FORM:

1) Solve the equation $8y + 3 = 2y + 18$.

.....
.....
.....
..... [2 marks]

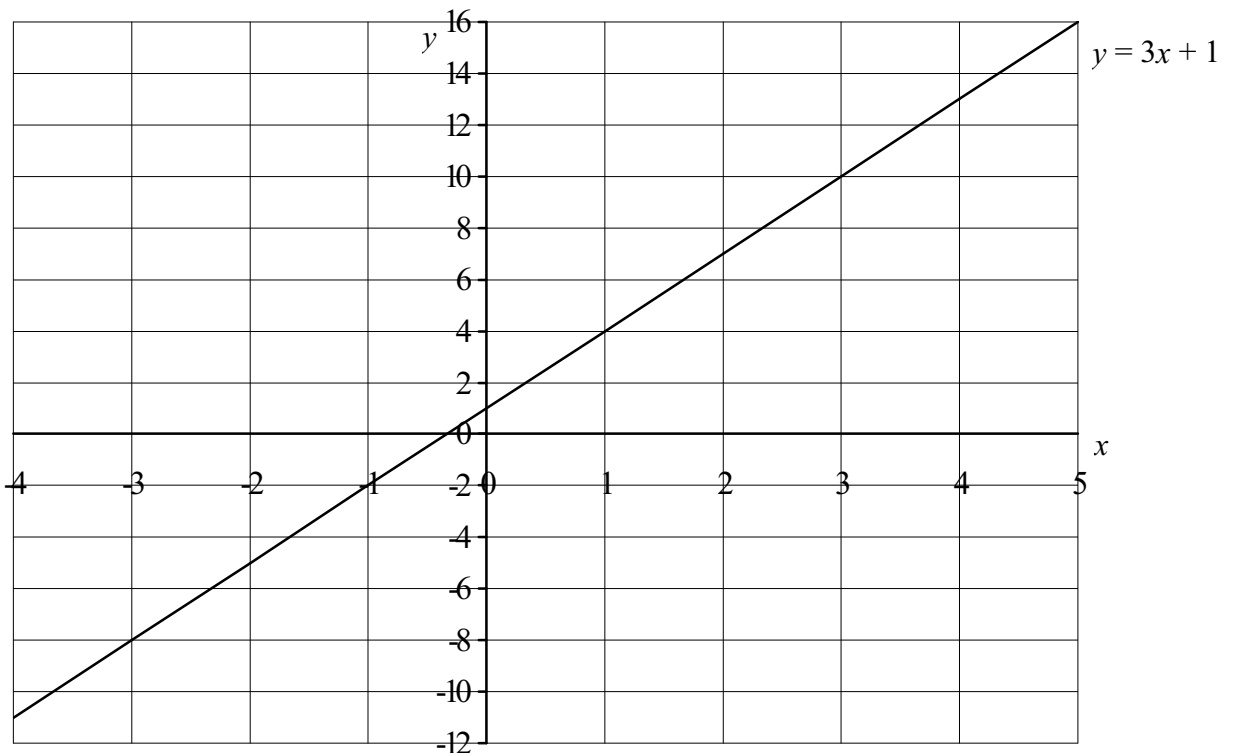
2) a) Write down two negative numbers x and y such that $x - y = 7$.

.....
..... [1 mark]

b) Write down two negative numbers x and y such that $x - y = -7$.

.....
..... [1 mark]

3) The graph shows a straight line. The equation of the line is $y = 3x + 1$.



a) Does the point $(15, 47)$ lie on the line $y = 3x + 1$? Answer YES or NO.

.....

Explain how you know.

.....
.....
..... [1 mark]

b) Which calculation below shows how many people worked for the company in **1997**.

$4000 \times 0.1 \times 0.2$

4000×0.1^2

$(4000 \times 0.1)^2$

$4000 \times 1.1 \times 2$

4000×1.1^2

$(4000 \times 1.10)^2$

..... [1 mark]

c) Look at these figures for the Beta Company:

1995	employed n people
1996	employed 20% fewer people
1997	employed 10% more people

Write an expression using n to show how many people the company employed in **1997**.

Show your working and write your expression as simply as possible.

.....

 [3 marks]

6) a) Multiply the brackets out in the expression. $(2x + 1)(x - 3)$.
 Simplify your answer as far as possible.

.....

 [2 marks]

b) The subject of the equation below is p . $p = 3(e - 2f)$.

Rearrange the equation to make e the subject.

.....

 [2 marks]

7) I fill a glass with orange juice and lemonade in the ratio 1 : 6.
 I drink $\frac{1}{3}$ of the contents of the glass, then I fill the glass using orange juice.
 Now what is the ratio of orange juice to lemonade in the glass? Write the ratio in its simplest form.

.....

 [2 marks]

ANSWERS.

1) $y = 2.5$.

3) a) No. If $x = 15$, then $y = 3 \times 15 + 1 = 46$, not 47. b) (2.5, 8.5).

4) a) 0.65, b) If there were 30 blue then there would be $30 \div 4 = 7.5$ red. c) 4, 1, 9, 6.

5) a) In 1996 there were 4400 people employed, an increase of 400.

In 1997 there were 4840 people employed, an increase of 440; **not 400**.

Alternatively. 10% of the 1996 figure is not 10% of 4000 etc.

b) 4000×1.1^2 . c) In its' simplest form, $n \times 0.88$. $\{n \times 0.8 \times 1.1.\}$

6) a) $2x^2 - 5x - 3$, b) $e = \frac{p+6f}{3}$ or $\frac{p}{3} + 2f$.

7) 3 : 5.