Test 3 **Essential Maths Book 7H Year End**

Calculators may be used

---

1. Look at the equation $3x + 2 = y$

Use the equation above to complete the two equations below.

$3x + 2 = y$

$12x + 8 =$ …….

…….. $= 6y$

(2 Marks)

---

2. (a) Draw a pair of axes with values of x and y from 0 to 6.

(i) Mark the point A with coordinates (3, 5) (1 Mark)

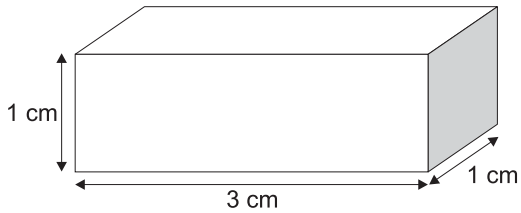
(ii) Mark two points that have an x-coordinate of 2. (1 Mark)

(iii) On your graph draw the straight line through all the points that have an x-coordinate of 2. (1 Mark)

(b) On your graph draw and label the line $y = 4$. (1 Mark)

---

3. Neal has lots of blocks like these.

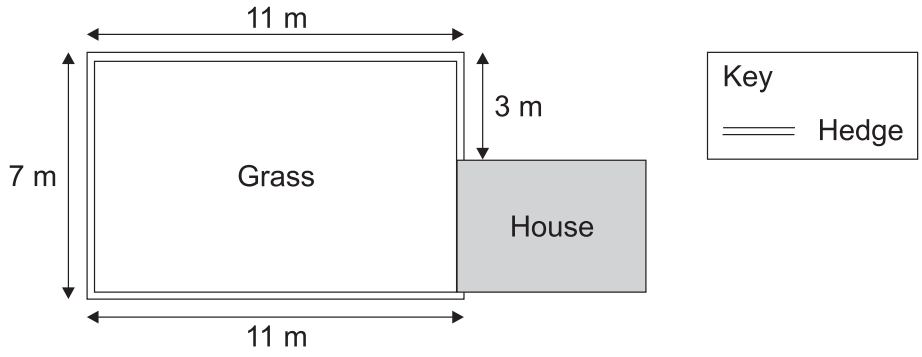


Neal uses the smallest number of blocks he can to make a **cube**.

(a) How many blocks did Neal use? (2 Marks)

(b) Work out the volume of the cube he made. (1 Mark)

4. The diagram shows a plan of a house and garden.



A gardener charges 70 pence for cutting each metre of hedge and 25 pence for each square metre of grass.

How much will it cost for this garden? (3 Marks)

---

5. Look at the numbers below:
Write down the numbers which **round to 18** to the nearest whole number.

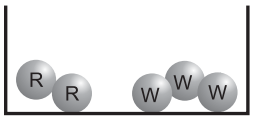
17.46 17.54 17.55 18.48 18.5 18.54 (2 Marks)

---

6. Kirsty puts a whole number into her calculator.
When she divides the number by 99
her calculator shows 1.34343434343
What whole number did Kirsty put into her calculator? (2 Marks)

---

7. A box contains 2 red balls and 3 white balls.



(a) One ball is selected at random. What is the probability of selecting a white ball? (1 Mark)

(b) One ball is selected and then replaced.
This procedure is repeated 150 times.
How many times would you expect to select a red ball? (2 Marks)

---

8. The width of a rectangle is (x + 5) cm and its perimeter is (6x + 12) cm.
The length of the rectangle is 8 cm.
Find the area of the rectangle. (4 Marks)

9. Here are five numbers.

11 3 1 13 7

(a) What is the *median* of these numbers? (1 Mark)

(b) Which number is the *mean* of the other four numbers? (1 Mark)

---

10. (a) Draw a rectangle like the one shown. Draw two straight lines inside the rectangle to that the rectangle is divided into 3 triangles. (1 Mark)

(b) Draw another rectangle like the one shown. Now draw two straight lines inside it so that the rectangle is divided into 1 quadrilateral and 2 triangles. (1 Mark)

(c) Draw a third rectangle like the one shown. Draw straight lines inside the rectangle so that the rectangle is divided into 3 quadrilaterals and 1 triangle. (2 Marks)

---

11. (a) Write $\frac{5}{8}$ as a decimal. (1 Mark)

(b) Write $\frac{9}{12}$ as a percentage. (1 Mark)

(c) Work out $\frac{1}{3} + \frac{1}{5}$ (1 Mark)

---

12. A jar with 10 sweets in it weighs 300 g.
The same jar with 24 sweets in it weighs 412 g.
How much does the jar weigh on its own? (2 Marks)

---

13. Write each calculation and fill in the missing numbers

(a) 76 × ……. = 760000

(b) 3.5 × ……. = 350

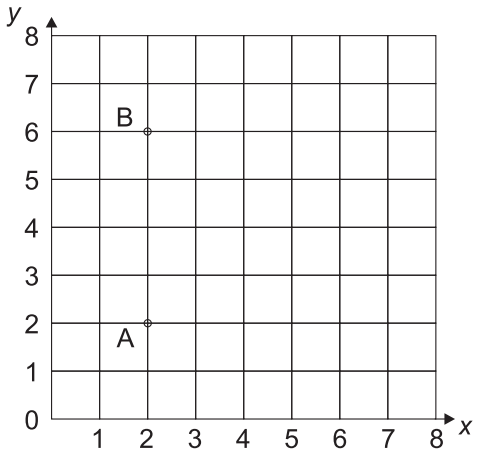
(c) 0.7 ÷ …….. = 0.007 (3 Marks)

14. Ben starts to draw a quadrilateral ABCD. He plots the points A and B.

(a) Write down the coordinates of point B. (1 Mark)

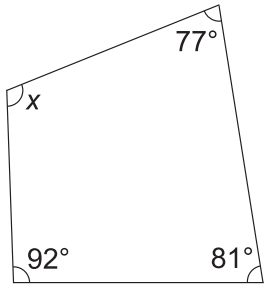
(b) Copy the graph and plot the point C at (7,6) (1 Mark)

(c) The quadrilateral ABCD has two lines of symmetry.
Plot the point D and then draw Ben's quadrilateral. (1 Mark)



---

15. (a) Work out the size of angle *x*

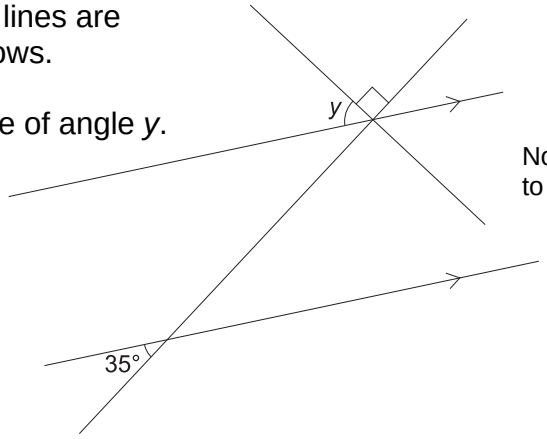


Not drawn to scale

(1 Mark)

(b) The two parallel lines are marked with arrows.

Work out the size of angle *y*.



Not drawn to scale

(1 Mark)

---

16. (a) One ball is selected at random from a bag containing 3 blue balls and 4 green balls.
What is the probability of selecting a blue ball? (1 Mark)

(b) One ball is selected at random from a bag containing *r* red balls and *w* white balls.
What is the probability of selecting a white ball?
Write your answer using the letters *r* and *w*. (2 Marks)

17. Solve the equations

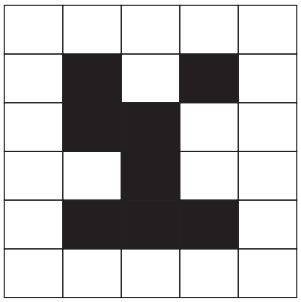
(a) $3n + 40 = 61$ (1 Mark)

(b) $6(2x + 1) = 58$ (1 Mark)

(c) $61 = 7y - 2$ (1 Mark)

---

18. Draw the diagram shown on squared paper.



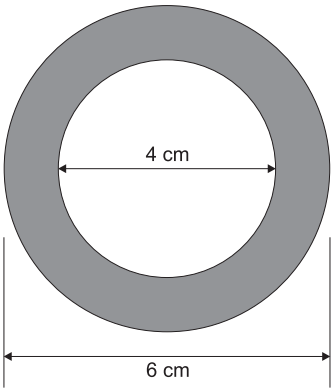
(a) Shade *one more* square to make a shape with one line of symmetry. (1 Mark)

(b) *Move one* square on the original diagram to a different position to make a shape with *two* lines of symmetry. (2 Marks)

---

19. The diagram shows two circles with diameters 4 cm and 6 cm.

Give your answers correct to 1 decimal place. Use the π button on your calculator or use $\pi = 3.142$.



(a) Work out the circumference of the outer circle. (1 Mark)

(b) Work out the area of the shaded region. (2 Marks)

---

20. (a) The rule for a sequence is '*multiply by 2 and add 3*'.

Copy this sequence and find the missing numbers.

1	5		

(2 Marks)

(b) The rule for a different sequence is '*multiply by 3 and subtract 1*'

Copy this sequence and find the missing numbers.

	5	14		

(3 Marks)