Practice Assessment 1

Year 8

Mathematics

Higher: No calculator allowed
Time allowed: 45 minutes

First name	
Middle name	
Last name	

Date of birth	Day		Month		Year	

Maths Group	

1 Find 3 pairs of equivalent expressions in the box below.

$2(a + 4)$	$5a - 15$	$a + a$
$9 + a$	$5(a - 3)$	a^2
$a \times a$	$2a + 6$	$a + 9$

[   ] and [   ]

[   ] and [   ]

[   ] and [   ]

2 What is the gradient of the line $y = 12 + 7x$?

Which of these graphs are linear?

Circle your answers.

$$y = 5x^2 \qquad y = \frac{7}{8}x \qquad y = 8 - x^3 \qquad y = x - 3$$

3 The table shows a number sequence.

Term	Pattern	Number of dots
1ˢᵗ $n = 1$	⚬⚬⚬	3
2ⁿᵈ $n = 2$	⚬⚬⚬⚬⚬⚬	
3ʳᵈ $n = 3$		
4ᵗʰ $n = 4$	⚬⚬⚬⚬⚬⚬⚬⚬⚬⚬⚬⚬	15

Complete the table.

Find an expression for the nth term of the sequence.

Fred says that the rule for this sequence is to multiply the previous term by 7

| 1 | | | | 2401 |

Is Fred correct?

Show your calculations below.

4 Work out the value of

$$7^0 + 81^{\frac{1}{2}}$$

Write $(9^3)^5$ as a single power of 9

5

The graph shows the relationship between miles and kilometres.

km

x (30, 48)

(0, 0)
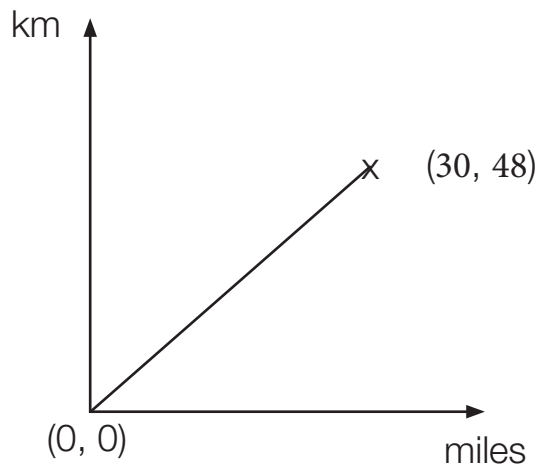
miles

What is the gradient of the line?

_____

1 mark

How many km is the same as 80 miles?

2 marks

6 Complete the statements using **<**, **>** or **=**

$$8 \times 10^{-1} \quad \bigcirc \quad 8 \times 10^{-3}$$

$$4 \times 10^{-1} \quad \bigcirc \quad \frac{1}{4}$$

2 marks

Write $(0.3)^3$ in standard form.

2 marks

7 The diameter of the wheels of a car is 54.1 cm

Use $\pi = 3$ to estimate the circumference of the wheel.

You must show your working.

2 marks

Complete

$$5 \text{ cm}^2 = \boxed{} \text{ mm}^2$$

1 mark

8 Complete the statements using **<**, **>** or **=**

£12 increased by $\frac{1}{3}$ ◯ £12 increased by 25%

130 kg decreased by 30% ◯ 100 kg

$\frac{1}{2} \times \frac{1}{3}$ ◯ $\frac{1}{2} \div \frac{1}{3}$

3 marks

9 Simplify

$6a^3 \times 2a \equiv$ ☐

$24b^2 \div 3b \equiv$ ☐

2 marks

10 A bag contains some counters.

15% of the counters are red
45% of the counters are blue
The other counters are white.

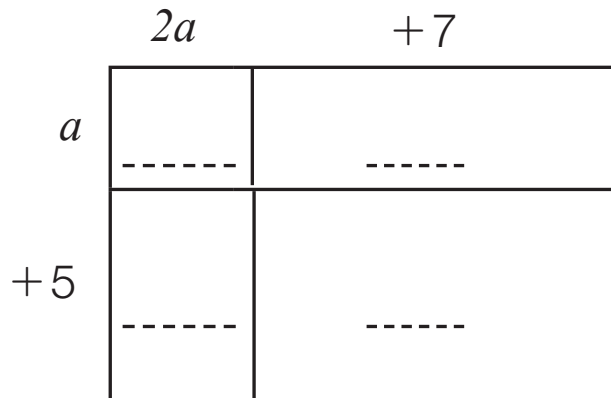There are 120 white counters.

How many counters are in the bag?

counters

The diagram below represents the multiplication

$$(2a + 7)(a + 5)$$

$$
\begin{array}{c|c|c}
 & 2a & +7 \\
\hline
a & \text{------} & \text{------} \\
\hline
+5 & \text{------} & \text{------} \\
\end{array}
$$

Complete the diagram.

2 marks

Expand and simplify

$$(a+9)(a-8)$$

1 mark

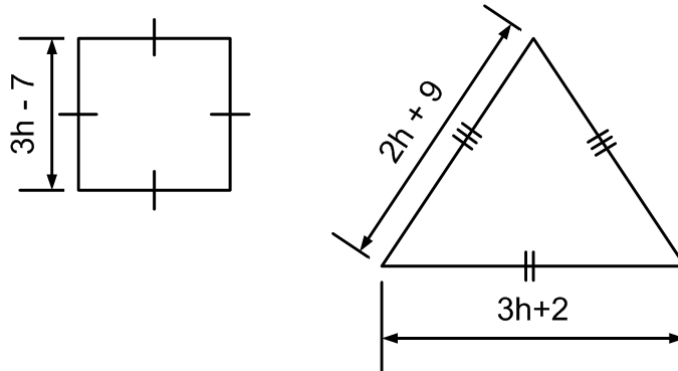**12**   After a 25% pay rise, Lewis earns £50,000 a year.

What did Lewis earn before his pay rise?

2 marks

13

Here is a square of side $2a$ and an equilateral triangle of side $a + 1$

The perimeter of the square is **greater** than the perimeter of the triangle.

Write an expression for the perimeter of the square.

1 mark

Write an expression for the perimeter of the triangle.

1 mark

Work out the range of possible values of a.

2 marks

14 A number k is rounded to 2 decimal

places. The result is 5.28

Write down the error interval for k.

$$\boxed{ \leq k < }$$

2 marks

END OF TEST

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