

Spring Assessment

# Year 8

## Mathematics

**Higher:** No calculator allowed

Time allowed: 45 minutes

First name						
Middle name						
Last name						
Date of birth	Day		Month		Year	
Teacher						

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For more information, please visit [www.whiterosemaths.com](http://www.whiterosemaths.com)



**1**

Find 3 pairs of equivalent expressions in the box below.

$2(a + 4)$

$3a - 12$

$a + a + a$

$8 + a$

$3(a - 4)$

$a^3$

$a \times a \times a$

$2a + 6$

$a + 8$

and

and

and

2 marks

**2**

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

1 mark

Which of these graphs are linear?

Circle your answers.

$$y = 2x^2$$

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




$$y = 12 - x$$

$$y = x^2 - 3$$

1 mark

**3**

The table shows a number sequence.

Term	Pattern	Number of dots
1 <sup>st</sup> $n = 1$		4
2 <sup>nd</sup> $n = 2$		
3 <sup>rd</sup> $n = 3$		10
4 <sup>th</sup> $n = 4$		13

Complete the table.

1 mark

Find an expression for the  $n^{\text{th}}$  term of the sequence.

2 marks

Rhys says that the rule for this sequence is to multiply the previous term by 5

1				625
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Is Rhys correct?

Show your calculations below.

1 mark

4

Work out the value of

$$4^0 + 64^{\frac{1}{2}}$$

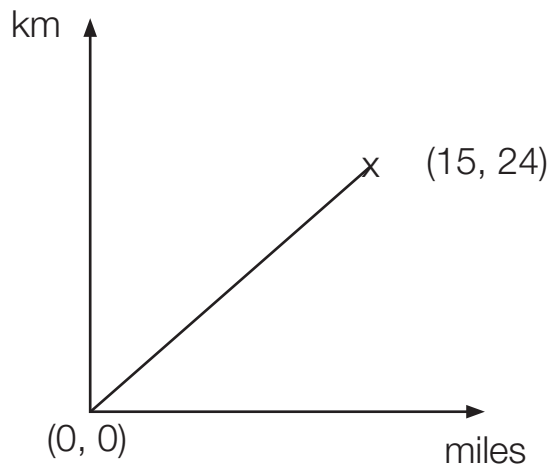
2 marks

Write  $(4^5)^6$  as a single power of 4

1 mark

5

The graph shows the relationship between miles and kilometres.



What is the gradient of the line?

\_\_\_\_\_

1 mark

How many km is the same as 40 miles?

\_\_\_\_\_

2 marks

6

Complete the statements using  $<$ ,  $>$  or  $=$

$$3 \times 10^{-1} \bigcirc 3 \times 10^{-2}$$

$$5 \times 10^{-1} \bigcirc \frac{1}{2}$$

2 marks

Write  $(0.2)^2$  in standard form.

2 marks

**7**

The diameter of the wheels of a car is 38.1 cm

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

You must show your working.

2 marks

Complete

$$1 \text{ cm}^2 = \boxed{\phantom{00000}} \text{ mm}^2$$

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

$$6a^2 \times 2a \equiv$$

$$6a^2 \div 2a \equiv$$

2 marks

10

A bag contains some counters.

5% of the counters are red  
35% of the counters are blue  
The other counters are orange

There are 108 orange counters.

How many counters are in the bag?

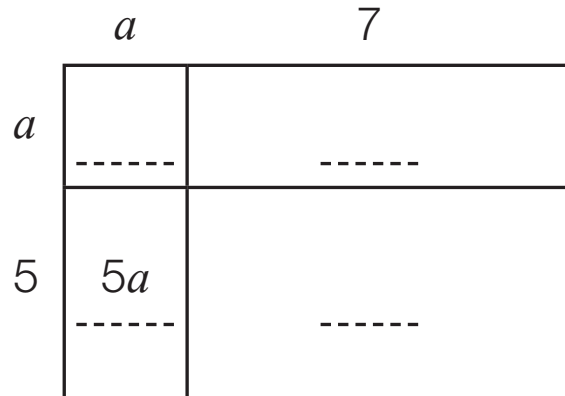
counters

3 marks

**11**

The diagram below represents the multiplication

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



Complete the diagram.

One has been done for you.

2 marks

Expand and simplify

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

1 mark

12

After a 20% pay rise, Janet earns £48 000 a year.

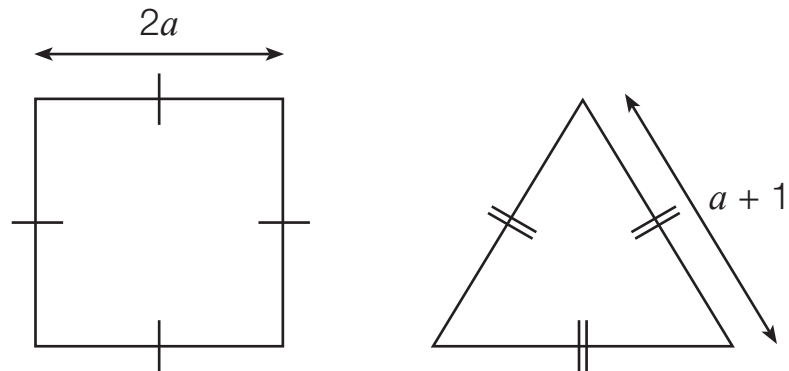
What did Janet earn before her pay rise?

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  $x$  is rounded to 1 decimal place.

The result is 4.7

Write down the error interval for  $x$ .

$\leq x <$

2 marks

**END OF TEST**

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