Name _____ Date _____

Stage 8 Diagnostic Check

1 Write these decimal numbers in order of size starting with the smallest.

3.21 3.009 3.206 3.07

_____ **[1]**

2 Fill in the missing terms in this sequence.

32, 26, ___, 14, 8, 2, ___, −10 **[1]**

3 Work out

a 2.4×10^4

_____

b $27.6 + 9.83$

_____

c 9×0.2

_____

d $6.105 \div 2$

_____ **[4]**

4 Which fraction is larger $\frac{13}{21}$ or $\frac{4}{7}$?

Show all your working.

_____

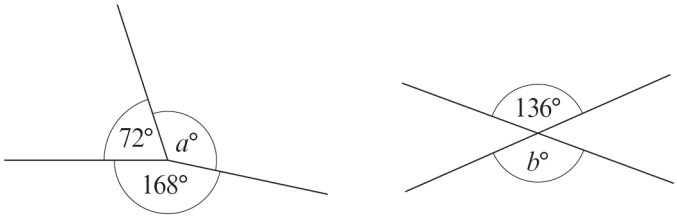
_____ **[2]**

5 Find the lowest common multiple (LCM) of 9 and 15.

_____

_____ **[1]**

6 Use these diagrams to work out the value of $b - a$.



_____

_____

_____ **[4]**

7 Fill in the missing number. $3\ \text{cm}^2 =$ _____ mm^2 **[1]**

8 Write each answer as a mixed number in its simplest form.

a $1\frac{1}{5} + 2\frac{2}{3}$ _____

b $\frac{9}{10} \div \frac{3}{7}$ _____ **[3]**

9 Draw a line to link each rectangular card to its correct oval description card.

$7 + 3x$	$7 + 3x = 22$	$h = 7 + 3x$

equation	formula	expression

[1]

10 Here are some numbers.

28	**13**	**−9**	**4**	**5**	**−5**	**2**	**3**

Use the numbers in the rectangle to fill in the spaces. Each number can only be used once.

a $\_\_\_^2 + \_\_\_ = 38$

b $\_\_\_ \times \_\_\_ = -27$

c $\_\_\_^3 - \_\_\_ = 36$

d $\sqrt[3]{\_\_\_} + \_\_\_ = -3$ **[4]**

11 Work out the value of $\frac{x}{5} + y$ when $x = 35$ and $y = 23$.

_____ **[1]**

12 Expand and simplify $3(x + 2) - 1$.

_____

_____ **[2]**

13 Write down the first three terms of this sequence.

First term is 5. Term-to-term rule is multiply by 3 then subtract 8.

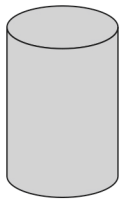
_____

_____

First term is _____ Second term is _____ Third term is _____ **[2]**

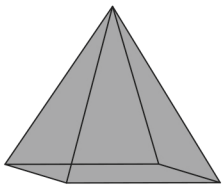
14 a Write the name of these 3D shapes.

A



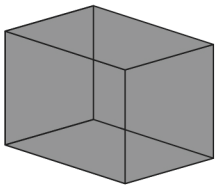
_____

B



_____

C



_____

b Draw the plan view, front elevation and side elevation of shape **A** in part **a**.

Plan view Front elevation Side elevation **[3]**

15 Lin wants to write a formula for the number of seconds in any number of minutes.

a Which of these formulae is the correct one, A or B? _____

A number of seconds = 60 × number of minutes

B number of minutes = 60 × number of seconds

b Write the correct formula using letters. Use s for seconds and m for minutes.

_____

c Use your formula to work out the number of seconds in 5 minutes.

_____ **[3]**

16 Complete this table of equivalent fractions decimals and percentages.

Write the fractions in their simplest form.

Fraction		$\frac{4}{5}$		
Decimal	0.2			0.05
Percentage			170%	

[3]

17 Share \$56 between Jan and Kai in the ratio 5 : 3.

_____

_____

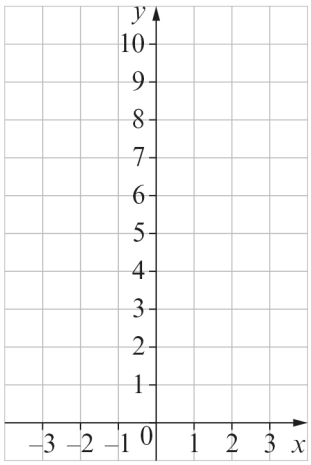
_____ **[3]**

18 The equation of a line is $y = x + 5$.

a Complete this table of values.

x	−2	−1	0	1	2
y					

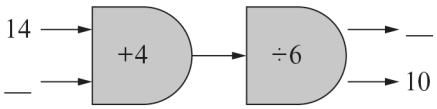
b Use the coordinate grid to draw a graph of the line $y = x + 5$.



c Is the point (23, 28) on the line? Explain your answer.

_____ **[5]**

19 Work out the missing input and output in this function machine.



[2]

20 Here are eight number cards.

2	4	7	9	12	15	22	50

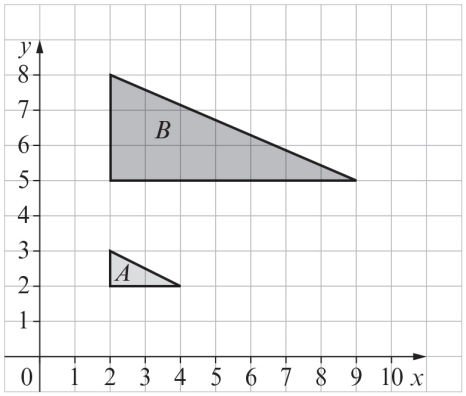
Simon takes a card at random. Work out the probability that the number on the card is

a an even number _____

b a number less than 10. _____ **[2]**

Write your answers as fractions in their lowest terms.

21 The diagram shows triangles A and B on a coordinate grid.



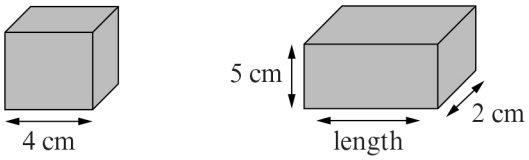
a Complete this statement.

'Triangle B is an enlargement of triangle A.

The scale factor is ____'

b On the diagram, rotate triangle A 180° centre (5, 2). **[2]**

22 This cube and cuboid have the same volume.



Work out the length of the cuboid.

_____

_____

_____ **[3]**

23 A map has a scale of 1 : 50 000.

The distance between two villages is 11 cm on the map.

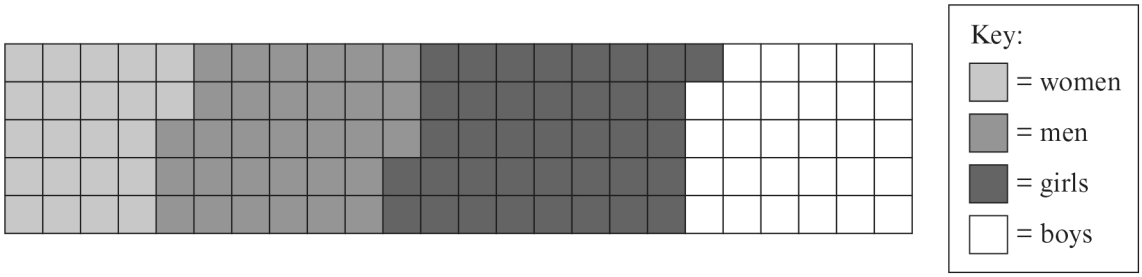
What is the distance, in km, between the two villages in real life?

_____

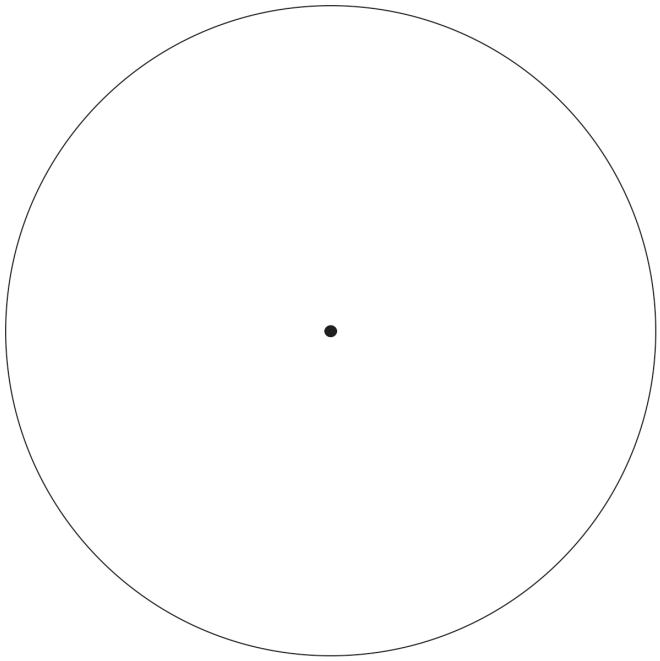
_____

_____ **[3]**

24 The waffle diagram shows the number of people in a running club.



Draw a pie chart to show the information in the waffle diagram. Show all your working.



[4]

[Total: 60 marks]

END OF TEST