



Mathematics Challenge 2014

25th January 2014

YEAR 5

Model Answers

We provide these model answers of our CWN: Mathematics Challenge 2014 exam to help parents.

Please note that for some problems there are more than one possible answer.

Some questions are open ended.

We strongly advise all children to practise the papers and think hard before looking at the answers provided.

Full answers and explanations will be provided on our feedback sessions.

In general, we expect units, directions, sensible answers and reasons in all questions.

Q1) A shop sells candles.



(a) Sapna buys 3 star candles and 4 stripe candles.

How much does she pay altogether?

Show how you worked out your answer.

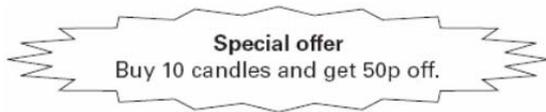
$$3 \times 60p = \text{£}1.80$$

$$+ 4 \times 85p = \text{£}3.40$$

(½ mark for method)

She pays: **£5.20** (½ mark)

(b) There is a special offer:



Josh buys 30 plain candles in the special offer.

How much does he pay for the 30 candles?

Show how you worked out your answer.

$$30 \times 35p = \text{£}10.50$$

$$\text{Less } \left(\frac{30}{10}\right) \times 50p = \text{£}1.50$$

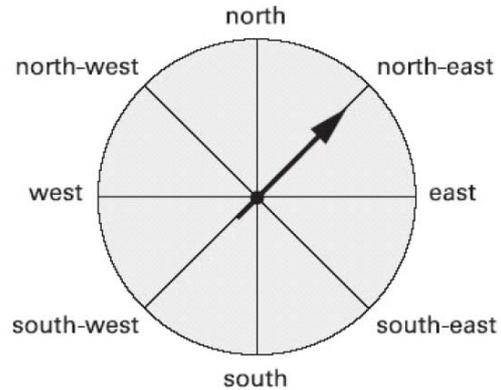
(½ mark for method)

He pays: **£9.00** (½ mark)

Q2) The arrow is pointing north-east.

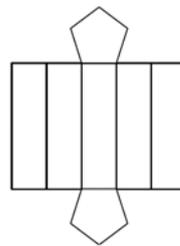
The arrow is moved a three-quarter turn anti-clockwise and then a quarter turn clockwise.

In which direction is the arrow pointing afterwards?

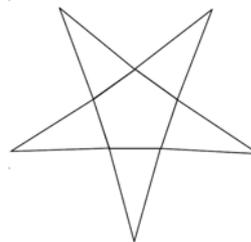


Answer: **south-west**
(1 mark)

Q3) Below are nets of two shapes. Please name the solid you will make with them.



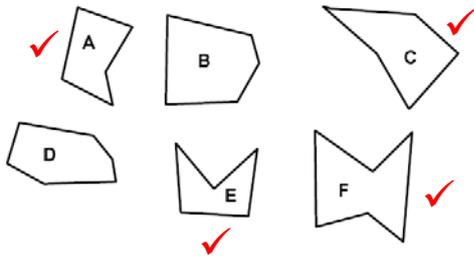
Pentagon-based prism
or **pentagonal prism**



Pentagon-based pyramid
or **pentagonal pyramid**

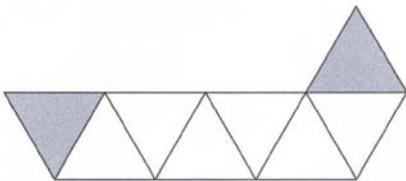
(2 marks)

Q4) Which of the shapes are concave polygons? Tick (✓) them.



(1 mark)

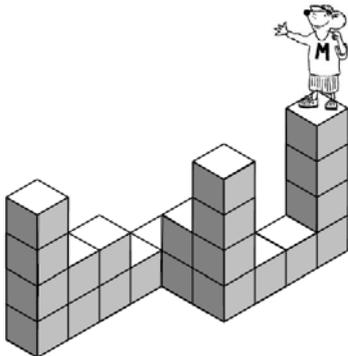
Q5) Nikki wants to shade three-quarters of this shape. She has already shaded two triangles. How many more triangles does she need to shade?



4

(1 mark)

Q6) Mohan wants to walk from the top of one tower to the tower at the end.



How many cubes does he need to fill in the spaces so that he can walk across without stepping down?

18

(1 mark)

Q7) Use these signs to make each of the five mathematical statements TRUE:

= < >

Write the correct signs in the boxes.

14×4 12×5

8×9 7×8

12×7 5×16

13×6 $\frac{1}{2}$

(2 marks)

Q8) Look at these weights.

70.7kg 70.07kg 77.7kg 70.77kg

(a) Arrange them in the order in the boxes.

70.07kg	70.7kg	70.77kg	77.7kg
least			most

(1 mark)

(b) Find their sum.

289.24 kg

(1 mark)

(c) Calculate 70.7 divided by 7.07

10

(1 mark)

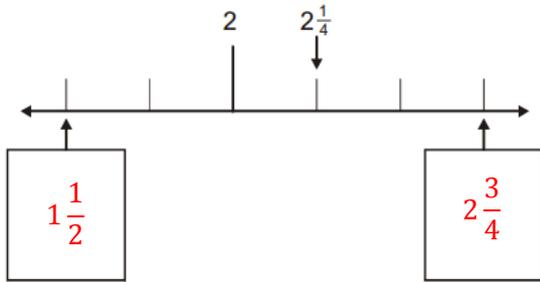
(d) Work out 70.7 multiplied by 7

494.9

(1 mark)

Q9) Here is part of a number line.

(a) Write in the two missing numbers.



(1 mark)

(b) Work out their sum.

$$4\frac{1}{4}$$

(1 mark)

Q10)

(a) Draw a ring around the fraction which is equal to **zero point zero four**.

$$\frac{1}{4} \quad \frac{1}{40} \quad \frac{1}{400} \quad \frac{4}{10} \quad \left(\frac{4}{100} \right)$$

(1 mark)

(b) Circle the fractions that are **less than half**.

$$\left(\frac{1}{8} \right) \quad \frac{6}{10} \quad \frac{5}{8} \quad \left(\frac{3}{10} \right)$$

(1 mark)

Q11) Rani went on holiday.

In 5 days she took 50 photographs.

Each day she took 4 less photographs than the day before.

How many photographs did she take each day?

Day 1: 18 photographs

Day 2: 14 photographs

Day 3: 10 photographs

Day 4: 6 photographs

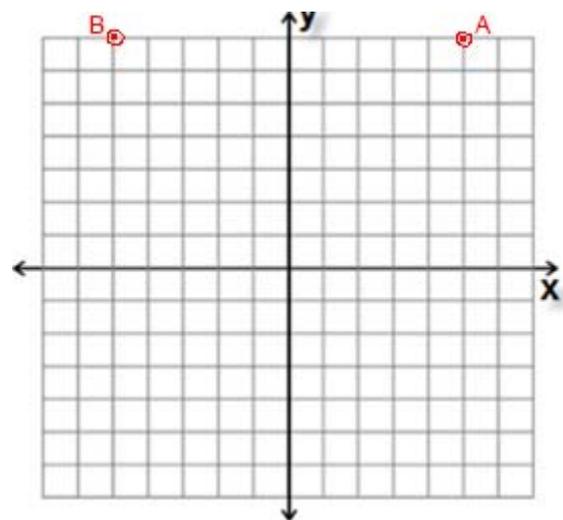
Day 5: 2 photographs

(2 marks)

Q12)

(a) Plot the point (5, 7) on the coordinate plane and label it **A**.

1 small square = 1 unit



(1 mark)

(b) Then plot the point (- 5, 7) and label it **B**.

(1 mark)

(c) What is the relationship between **A** and **B** in terms of a transformation?

A (or B) is the reflection of B (or A) on the y axis.

(1 mark)

Q13) This is a compass coastguards use to direct ships.



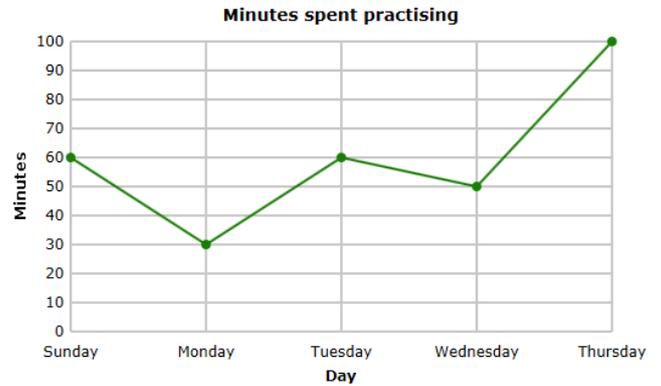
A ship faces North-East. It needs to turn clockwise 1 right angle.

After the turn which direction will it be facing?

South-East

(1 mark)

Q14) Ram kept a log of how long he spent on school homework every day for a week. He did not spend any time doing homework on Friday or Saturday.



(a) On which day(s) did he spend the least time on homework?

Friday and Saturday

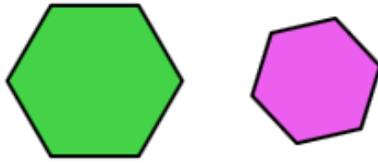
(1 mark)

(b) What is the mean number of minutes he spent on homework in the week to the nearest minute?

43 minutes

(1 mark)

Q15) How are these two geometrical figures related?



Circle the correct answer:

- They are congruent to each other
- They are similar to each other
- They are neither congruent nor similar
- They are both similar and congruent

(1 mark)

Q16) The table shows the cost of coach tickets from your place to different cities.

		Hull	York	Leeds
Adult	single	£12.50	£15.60	£10.25
	return	£23.75	£28.50	£19.30
Child	single	£8.50	£10.80	£8.25
	return	£14.90	£17.90	£14.75

(a) What is the total cost of a return journey to York for one adult and two children?

$$\begin{aligned}
 & \text{£ } 28.50 + (2 * \text{£ } 17.90) \\
 & = \text{£ } 28.50 + \text{£ } 35.80 \\
 & = \text{£ } 64.30
 \end{aligned}$$

(1 mark)

(b) How much **more** does it cost for two adults to make a single journey to Hull than to Leeds?

$$\begin{aligned}
 & 2 \times (\text{£ } 12.50 - \text{£ } 10.25) \\
 & = \text{£ } 4.50
 \end{aligned}$$

or $\text{£ } 25 - \text{£ } 20.50 = \text{£ } 4.50$

(1 mark)

(c) How much **more** does it cost for an adult and a child to buy single journey tickets to and from Hull, rather than buying return tickets?

$$\begin{aligned}
 & 2 \times (\text{£ } 12.50 + \text{£ } 8.50) \\
 & - (\text{£ } 23.75 + \text{£ } 14.90) \quad (1 \text{ mark}) \\
 & = \text{£ } 42 - \text{£ } 38.65 \\
 & = \text{£ } 3.35 \quad (1 \text{ mark})
 \end{aligned}$$

Q17) Each shape represents a number. Work out the value on the last line.

$$\text{Cross} + \text{Cross} + \text{Cross} = 24$$

$$\text{Triangle} + \text{Cross} = 26$$

$$\text{Triangle} - \text{Diamond} = 8$$

$$\text{Diamond} + \text{Triangle} \times \text{Cross} = \boxed{154}$$

(2 marks)

Q18)

- (a) What is the smallest number that leaves remainder 1 when divided by 2, 3, 4, and 6?

13
(1 mark)

- (b) What is the smallest number that leaves a remainder of 1 when divided by 2, AND, a remainder of 2 when divided by 3?

5
(1 mark)

Q19)

- (a) The ratio of two numbers is 3, and their difference is 2.

What are those numbers?

3 and 1
Accept "1 and 3"
(1 mark)

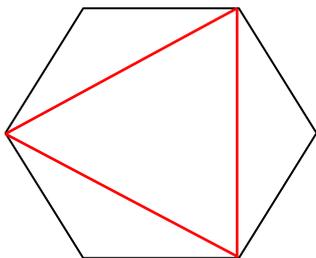
- (b) The product of two numbers is 143 and their difference is 2.

What are those numbers?

11 and 13
Accept "13 and 11"
(1 mark)

Q20)

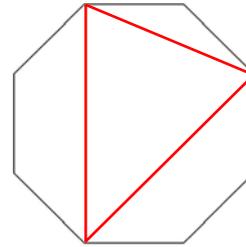
- (a) Here is a regular hexagon. Using a ruler, join three vertices to make an equilateral triangle. Accept any valid answer, e.g.:



(1 mark)

- (b) Here is a regular octagon. Using a ruler, join three vertices to make an isosceles triangle.

Accept any valid answer, e.g.:



(1 mark)

- Q21)** Probabilities are given on a scale of 0 to 1 in either decimal or fraction in Mathematics.

- (a) Tick (✓) the statements that are reasonable.

- The probability that you will go to bed before midnight is 0.99
- The probability that tomorrow is Wednesday is 0.99
- The probability that you will win the lottery is 0.5
- The probability that you will not win the lottery is 0.5

(1 mark)

- (b) Two standard tetrahedral (four-sided) dice are thrown.



What is the probability that the sum of the scores will be greater than 5?

$\frac{3}{8}$

(1 mark)

Q22) Sarah, Julie, Ranjan and Paul each choose a sandwich filling. They can choose from:

- tuna,
- salad,
- cheese, or
- chicken.

Each child chooses a different filling.

Clues

- Sarah doesn't like fish.
- Julie cannot eat dairy products.
- Ranjan does not eat meat or fish.
- Julie doesn't like tuna or chicken.

Which sandwich filling does each child choose?

	Sarah	Julie	Ranjan	Paul
tuna	x	x	x	✓
salad		✓		
cheese		x	✓	
chicken	✓	x	x	

Sarah: **chicken**
 Julie: **salad**
 Ranjan: **cheese**
 Paul: **tuna**

(2 marks)

Q23)

(a) I am thinking of a 3-D object.

It has a circular base and one curved surface.

What could the 3-D objects be?
 Write the names of two possible shapes.

Answer 1: **cone**

Answer 2: **cylinder**

(1 mark)

(b) This table shows information about four 3-D solid shapes.

Complete the table.

	Number of flat surfaces	Number of curved surfaces
Sphere	0	1
Cube	6	0
Cone	1	1
Cylinder	2	1

(2 marks)

Q24) Which is longer?

Award ½ mark for each correct answer below.

(a) 2m or 20cm?

Answer: **2m**

(b) 2m or 200cm?

Answer: **Both are the same**
 Accept: **Neither 2m nor 200cm.**

(c) 2 minutes or 200 seconds?

Answer: **200 seconds**

(d) 2 centuries or 200 years?

Answer: **Both are the same**
 Accept: **Neither 2 centuries nor 200 years.**

(2 marks)

Q25) On the coast there are three lighthouses.

The first light shines for 3 seconds, and then off for 3 seconds.

The second light shines for 4 seconds, and then off for 4 seconds.

The third light shines for 5 seconds, and then off for 5 seconds.

All three lights have come on together now.

- (a)** When is the first time that all three lights will be off?

Just after 5 seconds

(1 mark)

- (b)** When is the next time that all three lights will come on at the same moment?

Just after 120 seconds

(1 mark)