Parkfield School

Year 10 assessment 1

Marks \_\_\_\_\_

53

60 minutes

**NON – CALCULATOR**

**Q1.**

What is the area, in cm2, of a semicircle of radius 6 cm?

Circle your answer.

6π                            12π                            18π                            36π

**(Total 1 mark)**

**Q2.**

Work out the value of     4(2*x* + 3*y*)     when     *x* = 8   and   *y* = − 3

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**(Total 2 marks)**

**Q3.**

Work out  4 + 3 × 5 − 1

Circle your answer.

16       18       28       34

**(Total 1 mark)**

**Q4.**

Factorise     15*x* + 35*y* − 40*z*

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Total 1 mark)**

**Q5.**

Simplify  25 × 23

Circle your answer.

48        28        215        415

**(Total 1 mark)**

**Q6.**

Circle the expression that is equivalent to  3*a* − *a* × 4*a* + 2*a*

8*a*2 + 2*a*       12*a*2       5*a* − 4*a*2       3*a* − 6*a*2

**(Total 1 mark)**

**Q7.**

of the runners who started a marathon completed it.



of those who completed it are women.



180 women completed the marathon.

How many runners started the marathon?

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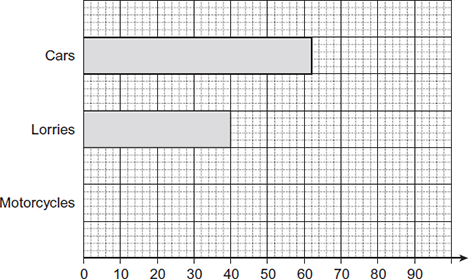
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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Total 3 marks)**

**Q8.**

**Average speed of vehicles on a motorway**



                                    Average speed (mph)

(a)     The average speed of motorcycles is 68 mph.

Complete the chart for motorcycles.

**(1)**

(b)     Write down the average speed of cars.

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mph

**(1)**

(c)     Work out the difference between the average speed of cars and lorries.

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mph

**(1)**

(d)     Harry says,

        ’**All** cars travel faster than lorries on this motorway.’

Is he correct?  
Give a reason for your answer.

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**(1)**

**(Total 4 marks)**

**Q9.**

Estimate the value of     19.42 + 30



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**(Total 3 marks)**

**Q10.**

Make *t* the subject of the formula        *w* = 3 +



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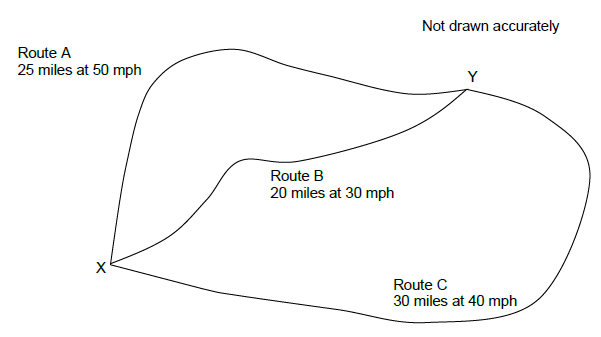
Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Total 2 marks)**

**Q11.**

The diagram shows three routes, A, B and C, between two towns, X and Y.

The distance and average speed for each route is shown.



(a)     Which of the three routes takes the longest time?

Assume the average speeds given.

You **must** show your working.

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(4)**

(b)     Jon and Matt take the same time to travel from X to Y.

Jon travels along route B at 10 mph **faster** than the average speed.

Matt travels along route C.

Does Matt travel faster or slower than the average speed for route C, and by how much?

You **must** show your working.

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Tick a box

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| Faster |  | Slower |  |

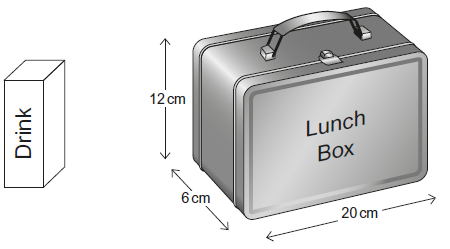
Answer .................................................... mph

**(3)**

**(Total 7 marks)**

**Q12.**

Here is a drink container and a lunch box.



The drink container is a cuboid with a square base.

The area of the base = 25 cm2

The volume of the container = 400 cm3

Will the container fit inside the lunch box?

You **must** show your working.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**(Total 4 marks)**

**Q13.**

(a)     Rob is going to drive 130 miles from Hull to Liverpool.

There are road works for 25 miles of the journey.

He assumes his average speed will be

50 mph where there are road works

70 mph for the rest of the journey.

Using his assumptions, work out his journey time.

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(4)**

(b)     Rob’s assumptions about his average speeds are too high.

How does this affect his journey time?

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**(1)**

**(Total 5 marks)**

**Q14.**

Bag A contains 10 blue balls and 20 red balls.

Bag B contains 8 blue balls and 12 red balls.



A ball is chosen at random from each bag.

Jo says,

“It is more likely that a blue ball is chosen from Bag A than Bag B because there are more blue balls in Bag A.”

Is she correct?

You **must** show your working.

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**(Total 3 marks)**

**Q15.**

A number is picked at random from the first four **prime** numbers.

A number is picked at random from the first four **square** numbers.

The two numbers are added to get a score.

(a)  Complete the table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Square numbers** | | | |
|  | **+** | **1** | **4** | **9** |  |
| **Prime numbers** | **2** |  |  |  |  |
| **3** |  |  | 12 |  |
|  |  |  |  |  |
| **7** |  |  |  |  |

**(4)**

(b)  What is the probability that the score is a **prime** number?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(1)**

**(Total 5 marks)**

**Q16.**

Work out



Give your answer as a mixed number.

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Total 4 marks)**

**Q17.**

Write 36 as a product of prime factors.

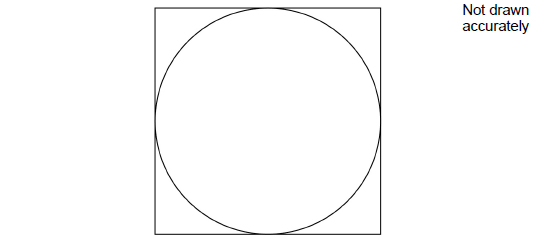
Give your answer in index form.

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**(Total 3 marks)**

**Q18.**

Here is a circle touching a square.



The area of the square is 64 cm2

Work out the area of the circle.

Give your answer in terms of *π*.

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Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm2

**(Total 3 marks)**