1 hour 30 mins

LPGS GCSE March Mock Paper 1

FOUNDATION TIER

Tuesday 12th March 2019 AFTERNOON

Name LJH

Maths Teacher WORKED SOLUTIONS

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may not be used.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

TOTAL MARK out 80 _____

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write the following numbers in order of size.
Start with the smallest number.

0.400 0.020 0.370 0.152 0.200

0·02, 0·152, 0·2, 0·37, 0·4

(Total for Question 1 is 1 mark)

2 Write 0.6 as a percentage.

60 %

(Total for Question 2 is 1 mark)

3 Here is a list of numbers.

3 5 7 12 15 18 20

From the list, write down a factor of 10

5

(Total for Question 3 is 1 mark)

4 Write 7829 to the nearest 1000

8000

(Total for Question 4 is 1 mark)

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5 (a) Work out $3 \times 5 + 7$

22

(1)

(b) Work out 2^3

8

(1)

(c) Write brackets ( ) in this statement to make it correct.

$$7 \times (2 + 3) = 35$$

(1)

(Total for Question 5 is 3 marks)

6 Sue has 2 cats.

Each cat eats $\frac{1}{4}$ of a tin of cat food each day.

Sue buys 8 tins of cat food.

Has Sue bought enough cat food to feed her 2 cats for 14 days?
You must show how you get your answer.

$\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$ tin cat food per day

8 tins $\times \frac{1}{2} = 16$

Sue has bought enough cat food to last for 16 days.

Yes, she has enough to feed her 2 cats for 14 days

(Total for Question 6 is 3 marks)

7 There are only apple trees, cherry trees, pear trees and plum trees in an orchard.

The pictogram shows information about the numbers of apple trees, cherry trees and pear trees in the orchard.

		total
Apple	4 4 4	12
Cherry	4 1	5
Pear	4 2	6
Plum		

Key: ☐ represents 4 trees

There is a total of 30 trees in the orchard.

Complete the pictogram.

$30 - (12 + 5 + 6)$

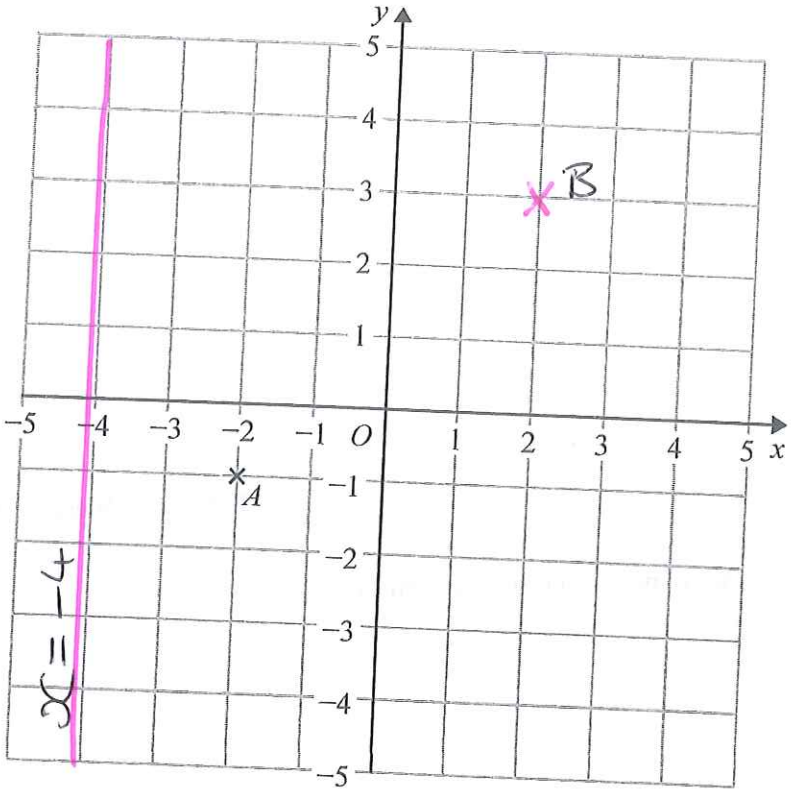
$= 30 - 23$

$= 7$

There are 7 plum treas in the orchard

(Total for Question 7 is 3 marks)

8



(a) Write down the coordinates of point A.

(−2 , −1)

(1)

(b) On the grid, mark with a cross (×) the point (2, 3)
Label this point B.

(1)

(c) On the grid, draw the line with equation $x = -4$

(1)

(Total for Question 8 is 3 marks)

9 $g = 9$
$h = 4$

Work out the value of $2g + 3h$

$= 2 \times 9 + 3 \times 4$
$= 18 + 12$
$= 30$

30

(Total for Question 9 is 2 marks)

10 Write down two prime numbers that have a sum of 32

prime numbers 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ...

29 and 3
or 19 and 13

..... , ...

(Total for Question 10 is 2 marks)

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11 Here are some fractions.

$\frac{9}{12}$ $\frac{6}{8}$ $\frac{18}{24}$ $\frac{10}{16}$ $\frac{15}{20}$

One of these fractions is **not** equivalent to $\frac{3}{4}$

(a) Which fraction?

$\frac{9}{12} \xrightarrow{\div 3} \frac{3}{4}$ $\quad \frac{18}{24} \xrightarrow{\div 6} \frac{3}{4}$ $\quad \frac{15}{20} \xrightarrow{\div 5} \frac{3}{4}$

$\frac{6}{8} \xrightarrow{\div 2} \frac{3}{4}$ $\quad \frac{10}{16} \xrightarrow{\div 2} \frac{5}{8}$

$\frac{10}{16}$

(1)

(b) Work out $\frac{1}{12} + \frac{5}{6}$

we need a common denominator

$\frac{1}{12} + \frac{5}{6} \times 2$

$= \frac{1}{12} + \frac{10}{12}$

$= \frac{11}{12}$

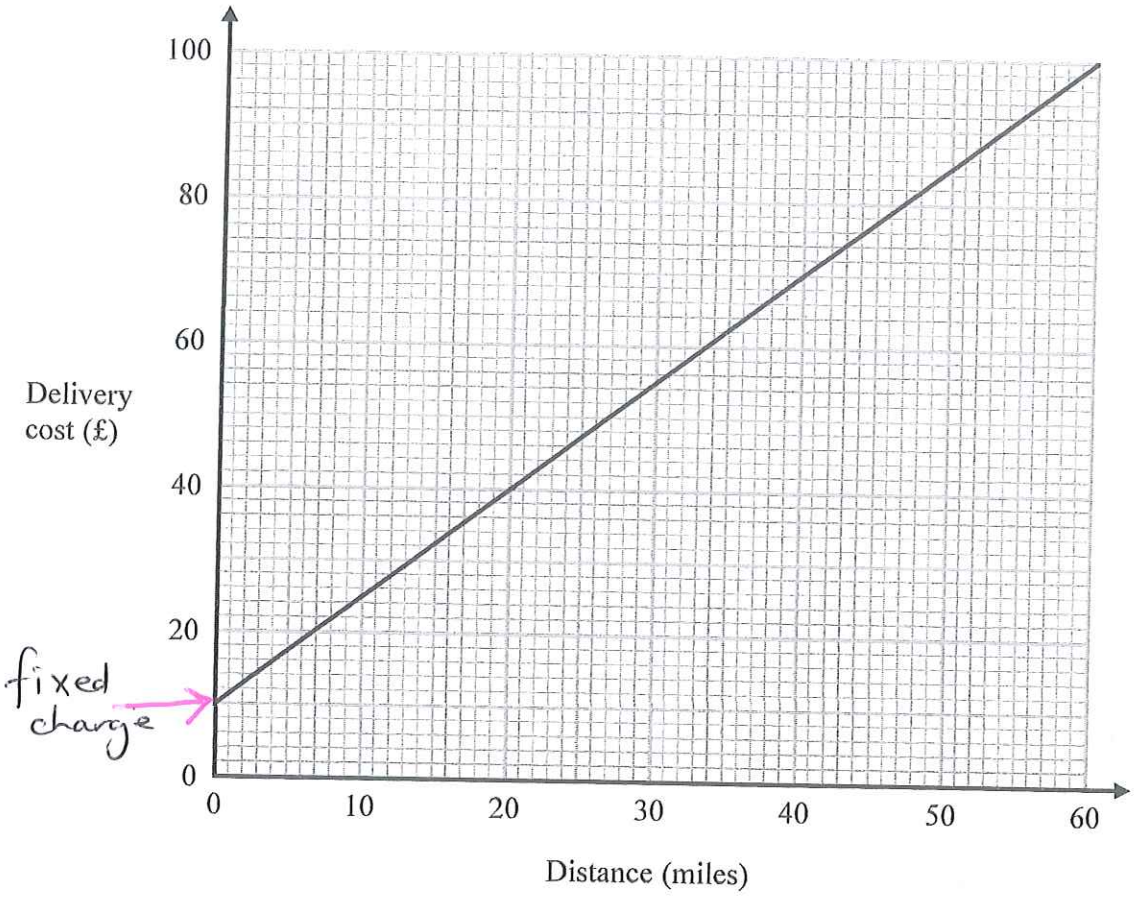
$\frac{11}{12}$

(2)

(Total for Question 11 is 3 marks)

12 Tom uses his lorry to deliver bricks.

You can use this graph to find the delivery cost for different distances.



For each delivery, there is a fixed charge plus a charge for the distance.

(a) How much is the fixed charge?

£ 10

(1)

Tom makes two deliveries of bricks.
The distance of one delivery is 20 miles more than the distance of the other delivery.

(b) Work out the difference between the two delivery costs.

miles	cost	
0	£10	+30
20	£40	+30
40	£70	+30
60	£100	

£ 30

(2)

(Total for Question 12 is 3 marks)

13 Azmol, Ryan and Kim each played a game.

Azmol's score was four times Ryan's score.
Kim's score was half of Azmol's score.

Write down the ratio of Azmol's score to Ryan's score to Kim's score.

Azmol : Ryan : Kim

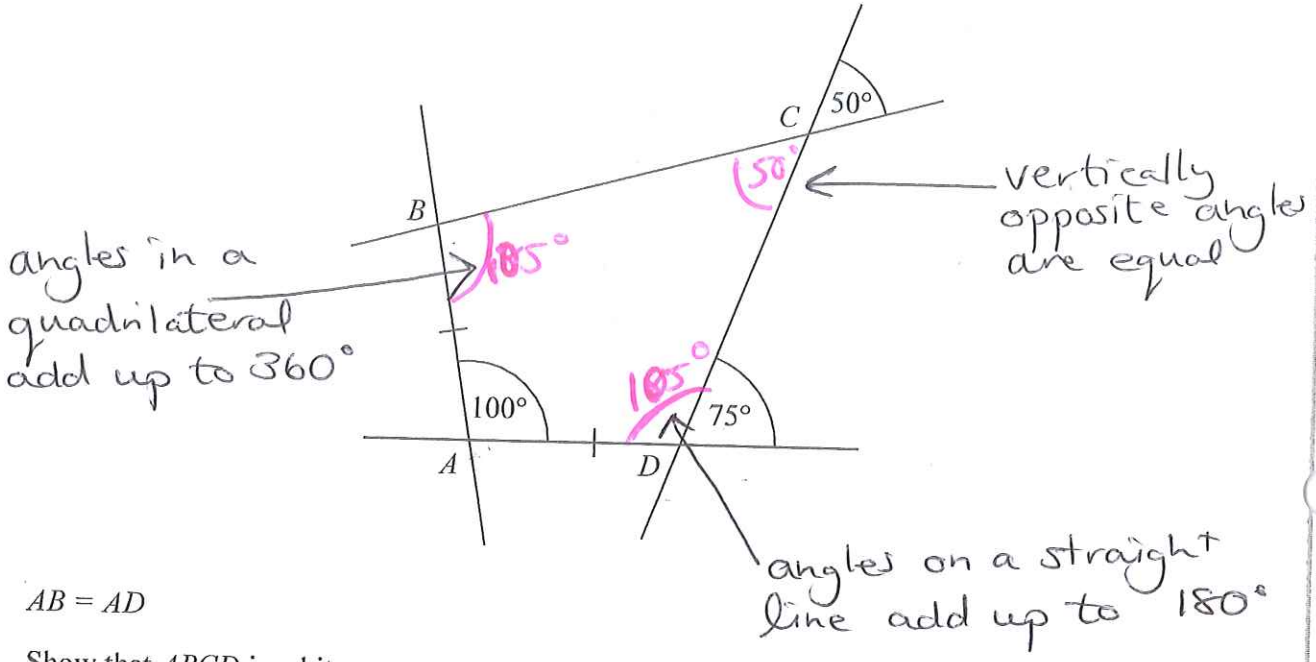
$4x : x : 2x$

4 : 1 : 2

4 : 1 : 2

(Total for Question 13 is 2 marks)

14 The diagram shows quadrilateral *ABCD* with each of its sides extended.



$AB = AD$

Show that *ABCD* is a kite.
Give a reason for each stage of your working.

$$\begin{array}{r} 100^\circ \\ +\,105^\circ \\ 50^\circ \\ \hline 255^\circ \end{array} \qquad \begin{array}{r} {}^{5}\not{3}{}^{1}\not{6}0^\circ \\ -\,255^\circ \\ \hline 105^\circ \end{array}$$

(Total for Question 14 is 4 marks)

15 Shahid is going to use these instructions to make a fizzy drink.

Mix 5 parts of orange juice with 2 parts of lemonade

O : L
5 : 2

Shahid thinks that he has 300 m*l* of orange juice and 200 m*l* of lemonade.

(a) If Shahid is correct, what is the greatest amount of fizzy drink he can make?

O : L
5 : 2
x60 x60
300ml : 120ml
this is how much orange juice Shahid has

300ml + 120ml
= 420 ml

(3)

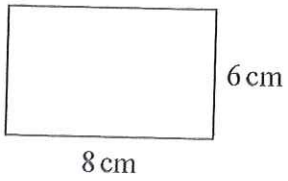
Shahid has 300 m*l* of orange juice but he only has 160 m*l* of lemonade.

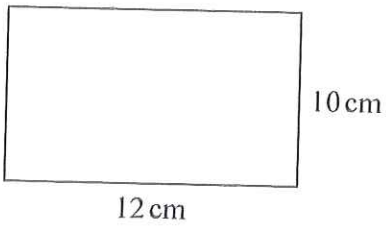
(b) Does this affect the greatest amount of fizzy drink he can make?
Give a reason for your answer.

No.
Shahid uses all 300 ml of orange juice and needs 120ml of lemonade so he does not need anymore. He will have 60 ml lemonade left over (1)

(Total for Question 15 is 4 marks)

16 Here are two rectangles.





Jim says,

"The two rectangles are similar because $8 + 4 = 12$ and $6 + 4 = 10$"

Is Jim correct?
Explain your answer.

Similar shapes must be in the same ratio
ie: we multiply the lengths by a scale factor

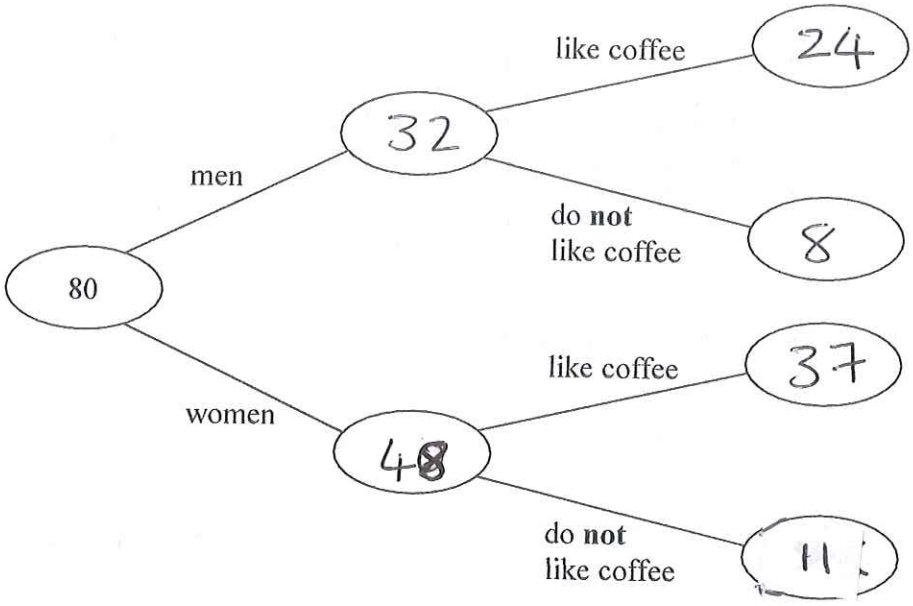
(Total for Question 16 is 1 mark)

17 80 people are asked if they like coffee.

48 of these people are women.
61 of the 80 people like coffee.
8 of the men do **not** like coffee.

	men	women	total
like coffee	24	37	61
don't like coffee	8	11	19
	32	48	80

(a) Use this information to complete the frequency tree.



(3)

One of the people who like coffee is chosen at random.

(b) Find the probability that this person is a woman.

$\frac{37}{61}$

.....

(2)

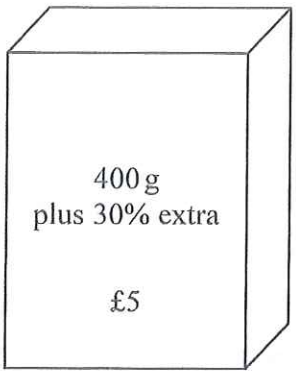
(Total for Question 17 is 5 marks)

18 Food Mart and Jan's Store sell boxes of the same type of breakfast cereal.

Each shop has a special offer.

Food Mart

Jan's Store



Which box of cereal is the better value for money?
You must show your working.

Food Mart

20% of £5 = £1

10% 50p
£5
20% £1

new price = £5 − £1
= £4

400g costs £4

÷4 ↓ 100g costs £1 ÷4

÷5 ↓ 20g costs 20p +

520g costs £5.20

Jan's Store

30% of 400g = 120g

10% 40g
400g
30% 120g

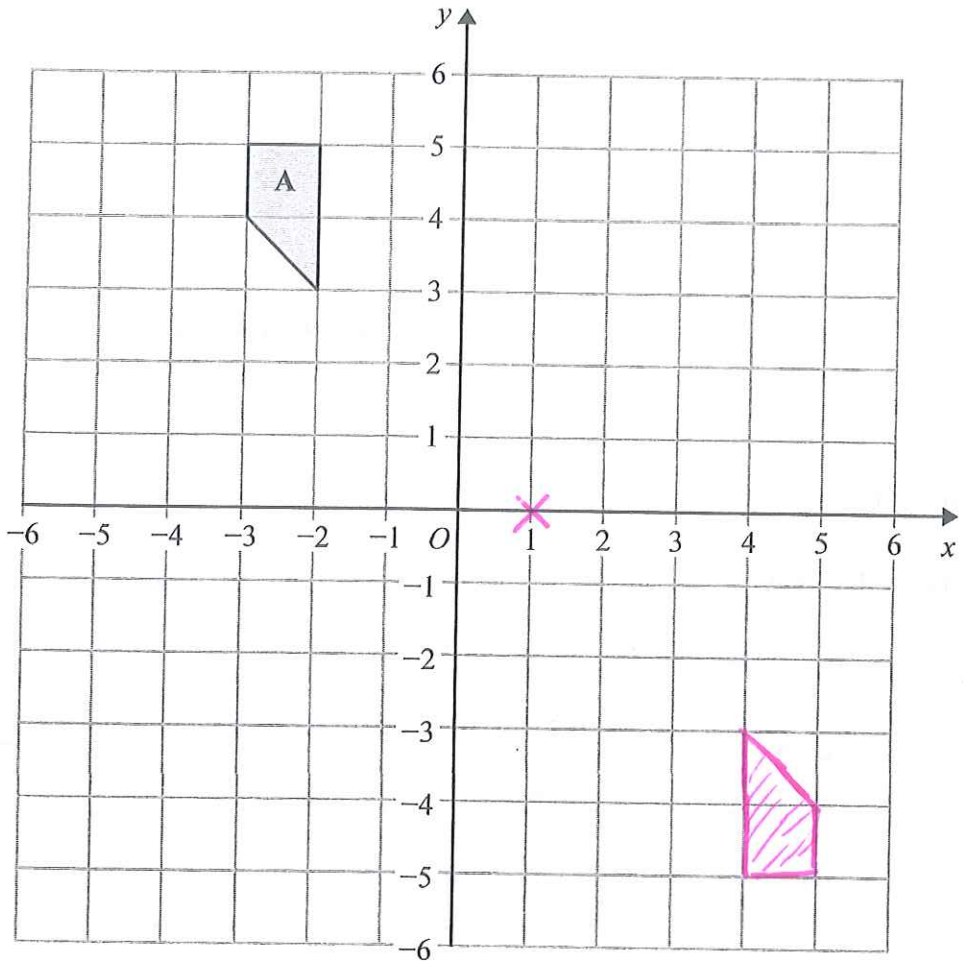
new amount = 400g + 120g
= 520g

520g costs £5

Jan's store is better value as 520g costs £5 whereas 520g costs £5.20 at Food Mart

(Total for Question 18 is 4 marks)

19



Rotate shape A 180° about (1, 0)

(Total for Question 19 is 2 marks)

20 Work out the value of $\frac{3^7 \times 3^{-2}}{3^3}$

$= \frac{3^{7-2}}{3^3} = \frac{3^5}{3^3} = 3^2 = 9$

9

(Total for Question 20 is 2 marks)

21 $v^2 = u^2 + 2as$

$u = 12 \quad a = -3 \quad s = 18$

(a) Work out a value of v.

$v^2 = 12^2 + (2 \times -3 \times 18)$

$= 144 + (-6 \times 18)$

$= 144 + (-108)$

$= 144 - 108$

$= 36$

$v = \pm 6$

$v = 6$ or $v = -6$ (2)

18 × 6 = 108

144 − 108 = 36

(b) Make s the subject of $v^2 = u^2 + 2as$

$v^2 = u^2 + 2as \quad [-u^2$

$v^2 - u^2 = 2as \quad [\div 2a$

$\frac{v^2 - u^2}{2a} = s$

$s = \frac{v^2 - u^2}{2a}$

(2)

(Total for Question 21 is 4 marks)

22 A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

"If the bonus is shared equally between all 10 people I will get 25% more money."

Is the salesman correct?
You must show how you get your answer.

40% of £2100 = £840

2100 → 10% £210
2100 → 40% £840

210 × 4 = 840

3 managers share £840 equally

$$3\overline{)840} = 280$$

each manager gets £280

£2100 − £840 = £1260

$$\begin{array}{r} {}^{10}\cancel{1}\,{}^{1}\cancel{2}\,\cancel{1}00 \\ -\ 840 \\ \hline 1260 \end{array}$$

7 salesmen share £1260 equally

$$7\overline{)1260} = 180$$

each salesman gets £180

If £2100 is shared equally between all 10 people each worker will get £210

comparing £180 with £210

$$\%\ \text{change} = \frac{£210 - £180}{£180} \times 100$$

$$= \frac{30}{180} \times 100$$

$$= \frac{1}{6} \times 100$$

this is not 25%
$\frac{1}{4} \times 100$ would be 25%
so the salesman is not correct **(Total for Question 22 is 5 marks)**

23 It would take 120 minutes to fill a swimming pool using water from 5 taps.

(a) How many minutes will it take to fill the pool if only 3 of the taps are used?

minutes : taps

120 : 5 (÷5)

×5 ↓ 600 : 1 (×3)

÷3 ↓ 200 : 3

indirect proportion

200 minutes

(2)

(b) State one assumption you made in working out your answer to part (a).

each tap fills at the same rate

(1)

(Total for Question 23 is 3 marks)

24 A plane travels at a speed of 213 miles per hour.

(a) Work out an estimate for the number of seconds the plane takes to travel 1 mile.

213 miles : 1 hour

213 miles : 60 mins

213 miles : 3600 seconds

this is approximately

200 miles : 3600 seconds (or $\frac{4000}{200}$ seconds)

÷200 ↓

1 mile : 18 seconds (or 20 seconds)

accept any answer from 16 to 20

seconds

(3)

(b) Is your answer to part (a) an underestimate or an overestimate?
Give a reason for your answer.

overestimate

the number of miles was rounded down

(1)

(Total for Question 24 is 4 marks)

25 Solve the simultaneous equations

$$5x + y = 21 \quad (1)$$
$$x - 3y = 9 \quad (2)$$

(1) × 3: $15x + 3y = 63$ (3)

(2) × 1: $x - 3y = 9$ (4)

DASS

(3) + (4): $16x = 72$

$x = \frac{72}{16} = \frac{9}{2}$ or 4·5

subs $x = 4{\cdot}5$ in (2) to find y:

$\frac{9}{2} - 3y = 9$ [$- \frac{9}{2}$

$-3y = 4{\cdot}5$ [$\div -3$

$y = \frac{9}{2} \div -\frac{3}{1}$

$y = \frac{9}{2} \times -\frac{1}{3}$

$y = -\frac{9}{6}$

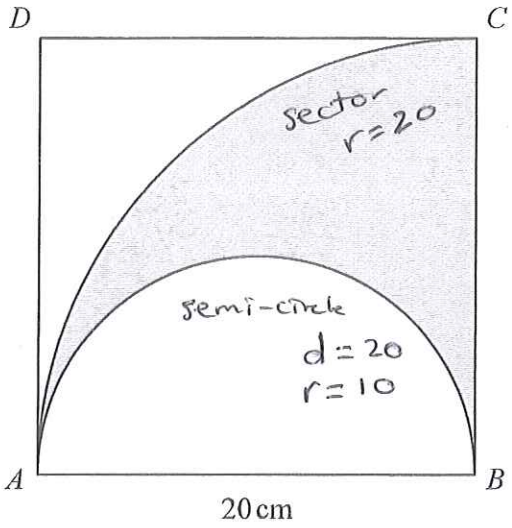
$y = -\frac{3}{2}$

$x =$ 4·5

$y =$ −1·5

(Total for Question 25 is 3 marks)

26 The diagram shows a square *ABCD* with sides of length 20 cm.
It also shows a semicircle and an arc of a circle.



AB is the diameter of the semicircle.
AC is an arc of a circle with centre *B*.

Show that $\dfrac{\text{area of shaded region}}{\text{area of square}} = \dfrac{\pi}{8}$

Area square = 20 cm × 20 cm
= 400 cm²

Area semi-circle = $\dfrac{\pi \times r^2}{2}$
= $\dfrac{\pi \times 10^2}{2}$
= $\dfrac{100\pi}{2}$
= 50π

Area sector ACB = $\dfrac{\pi \times r^2}{4}$
= $\dfrac{\pi \times 20^2}{4}$
= $\dfrac{400\pi}{4}$
= 100π

Area Shaded region
= Area Sector − Area semi-circle
= $100\pi - 50\pi$
= 50π

$\dfrac{\text{Area Shaded region}}{\text{Area square}} = \dfrac{50\pi}{400} = \dfrac{\pi}{8}$

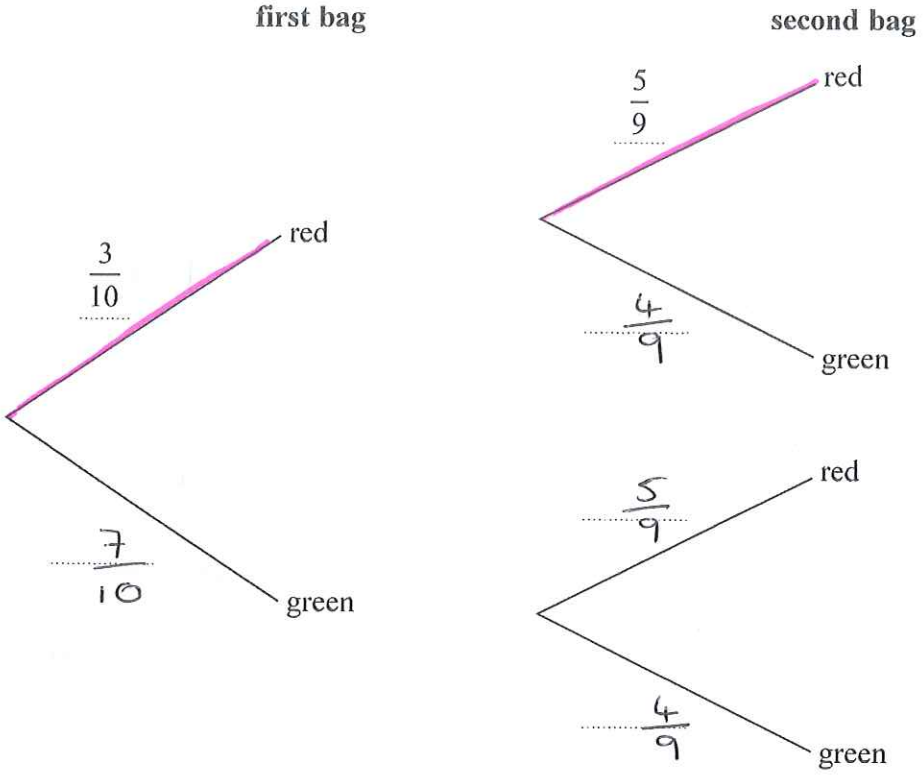
(Total for Question 26 is 4 marks)

27 Amina has two bags.

In the first bag there are 3 red balls and 7 green balls.
In the second bag there are 5 red balls and 4 green balls.

Amina takes at random a ball from the first bag.
She then takes at random a ball from the second bag.

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Amina takes two red balls.

$P(\text{Red and Red}) = \frac{3}{10} \times \frac{5}{9}$

$= \frac{15}{90}$

$= \frac{5}{30}$

$= \frac{1}{6}$

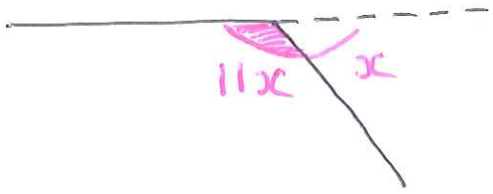
$\frac{1}{6}$

(2)

(Total for Question 27 is 4 marks)

28 The size of each interior angle of a regular polygon is 11 times the size of each exterior angle.

Work out how many sides the polygon has.



Interior angle + Exterior angle = 180°

$11x + x = 180°$

$12x = 180°$ [÷12

$x = 15$

$12\overline{)180}$ $\quad 15$

Sum of exterior angles = 360°

number sides = $\frac{360°}{15°} = 24$

$15\overline{)360}$ $\quad 24$

24 sides

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS