10 (a) Simplify fully $\left(16x^8y^6\right)^{\frac{1}{2}}$

(2)

(b) Solve $\dfrac{8-2x}{3} - \dfrac{2x-3}{2} = 4$

Show clear algebraic working.

$x =$ ....

(3)

(c) Make f the subject of $m = \sqrt{\dfrac{1}{3}ef}$

(2)

(Total for Question 10 is 7 marks)

11 The straight line L_1 has equation $x + 2y = 4$
The straight line L_2 passes through the points $(-1, -7)$ and $(7, 9)$

Michael says that the lines L_1 and L_2 are perpendicular.

Is Michael correct?
You must show clearly how you get your answer.

(Total for Question 11 is 3 marks)

12 Freddie recorded the number of runs he scored in each of 11 cricket matches.
Here are his results.

| 4 | 0 | 21 | 32 | 51 | 6 | 102 | 69 | 17 | 9 | 42 |

Find the interquartile range of his results.

(Total for Question 12 is 3 marks)

13 Carlos, Flavia and Tazia shared £861 between themselves.

The amount of money Flavia got is 65% of the amount of money Carlos got.
The amount of money Tazia got is 22% **more** than the amount of money Carlos got.

Work out how much money Carlos got.

£

(Total for Question 13 is 3 marks)

14 (a) Given that $a = 3^x$ and $b = 3^y$

express in terms of a or b or a and b,

     (i) 3^{2x}

     (ii) 3^{x+4y}

     (iii) 3^{y-1}

(3)

$a = 3^x$ and $b = 3^y$

$ab = 2187$

$a^2b = 177\,147$

(b) Work out the value of x and the value of y.
Show your working clearly.

$x =$

$y =$

(3)

(Total for Question 14 is 6 marks)

15 Barney has a biased coin.

When the coin is thrown once, the probability that the coin will land heads is 0.3

Barney throws the coin 4 times.

(a) Work out the probability that the coin will land heads exactly 3 times.

(3)

(b) Work out the probability that the coin will land heads at least once.

(2)

(Total for Question 15 is 5 marks)

16 120 people who visited a sports centre were asked if they went swimming (*S*), played basketball (*B*) or used the gym (*G*).

Their answers showed that

28 people went swimming
16 people played basketball
27 people used the gym
3 people went swimming and played basketball
5 people played basketball and used the gym
7 people went swimming and used the gym
2 people went swimming, played basketball and used the gym

(a) Using this information, complete the Venn diagram to show the number of people in each region of the Venn diagram.
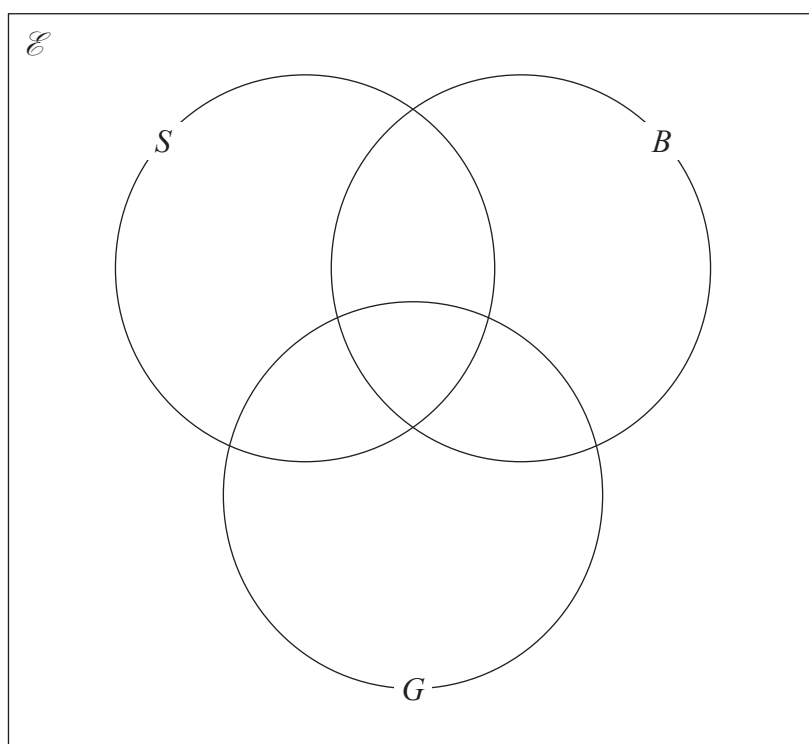
(3)

One of the people who went swimming is chosen at random.

(b) Find the probability that this person also played basketball.

(1)

(Total for Question 16 is 4 marks)

17 $P = ef$

$e = 4.8$ correct to 2 significant figures.
$f = 0.26$ correct to 2 significant figures.

(a) Work out the lower bound for the value of P.
Show your working clearly.
Give your answer correct to 3 significant figures.

(2)

$Q = \dfrac{t}{w}$

$t = 2.73$ correct to 3 significant figures.
$w = 0.04$ correct to 1 significant figure.

(b) Work out the upper bound for the value of Q.
Show your working clearly.
Give your answer correct to 2 significant figures.

(2)

(Total for Question 17 is 4 marks)

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