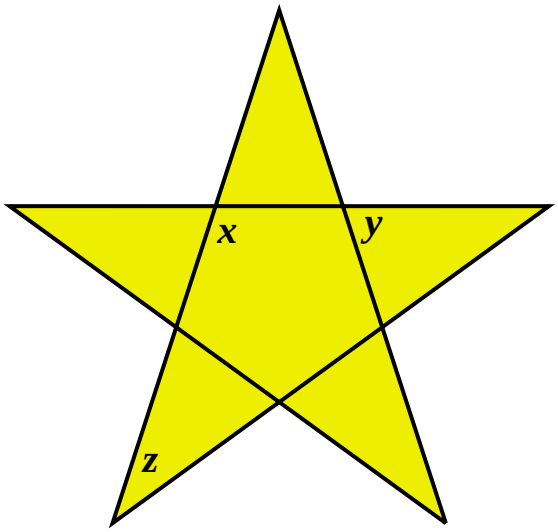
“Mind Your Maths” Number 2
Year 10 Exam Revision

You may use a calculator
Marks Available : 60

Question 1
A five pointed star with rotational symmetry of order five is shown below;



(a) Which one of the following is the name of this shape ?
Is it a **(i)** Pentagram
(ii) Hexagram
or **(iii)** Octogram ?

[1 mark]

(b) Calculate the size of ;
(i) angle *x*

[1 mark]

(ii) angle *y*

[1 mark]

(iii) angle *z*

[1 mark]

Question 2
A total of £108 is to be divided in the ratio 4 : 3 : 2 for Amy, Bob and Charles.
Calculate how much money each receives.

Amy _____ Bob _____ Charles _____

[2 marks]

Question 3
Expand the brackets and simplify;

(i) $(x + 11)(x + 7)$

[2 marks]

(ii) $(x - 15)(x + 3)$

[2 marks]

(iii) $(x - 8)^2$

[2 marks]

(iv) $(4x + 9)(3x - 5)$

[3 marks]

Question 4
Terry and June are given money in the ratio $6 : 7$ respectively.
Terry receives £39.
How much does June receive ?

[2 marks]

Question 5
Factorise fully each of the following,

(i) $x^2 + 4x - 77$

[2 marks]

(ii) $x^2 - 5x + 4$

[2 marks]

Question 6
Solve each of the following equations by first factorising the quadratics.
You must show sufficient working to make your method clear.

(i) $x^2 + 10x + 16 = 0$

[2 marks]

(ii) $x^2 - 8x - 33 = 0$

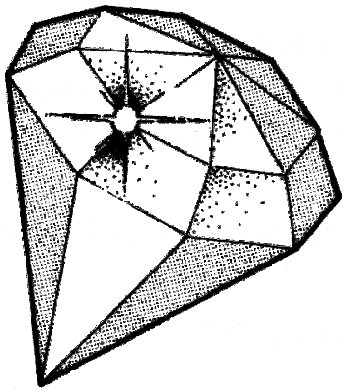
[2 marks]

Question 7

Mr Sparkle has decided to buy Mrs Sparkle a Wedding Anniversary present.
Via subtle hints from Mrs Sparkle, he knows that she likes diamonds.

The value, V, of a diamond is **directly** proportional to the **square** of its weight W.

In other words, $V = k W^2$ for some constant k that is to be found.



(i) Use the fact that a diamond weighing 10 grams is worth £200 to help you write down a formula that relates the value of a diamond to its cost.

[2 marks]

(ii) Show how you would use your part (i) formula to determine the value of a diamond weighing 30 grams.

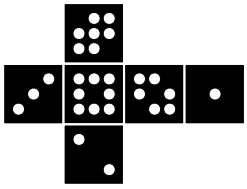
[2 marks]

(iii) Mr Sparkle decide to spend £5000.
What is the weight of the diamond that Mrs Sparkle can look forward to receiving on the day of the Anniversary?

[2 marks]

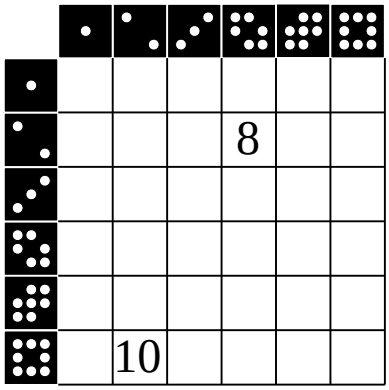
Question 8

The net of a *Lucky-Strike Dice*™ is shown :



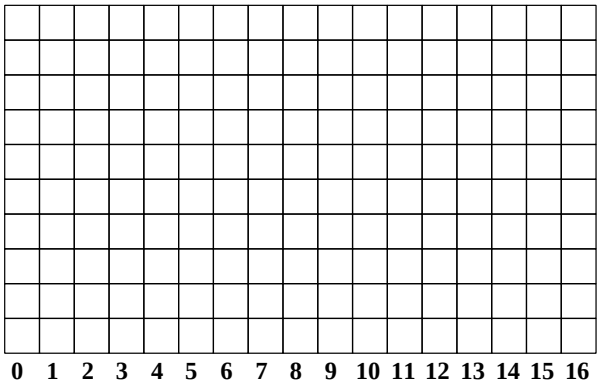
One orange and one blue *Lucky-Strike Dice*™ are rolled.
The number of pips showing are added together.

(a) Show the thirty-six possible results on this possibility state space diagram,



[2 marks]

(b) Plot a bar chart of the probabilities.



[1 mark]

(c) **(i)** Which score occurs most often ?

[1 mark]

(ii) Of the possible scores rolled, which are least likely ?

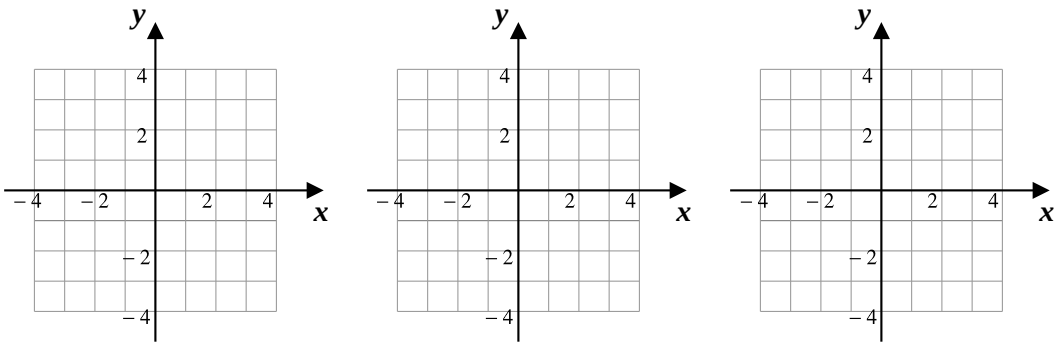
[1 mark]

(iii) What is the probability of rolling an odd number ?

[1 mark]

Question 9

On each graph use shading to draw the inequality specified.
Mark clearly the region wanted with the letter ***R***



$y > -1$ $\quad -3 \leqslant x < 1$ $\quad y \geqslant -2x + 2$

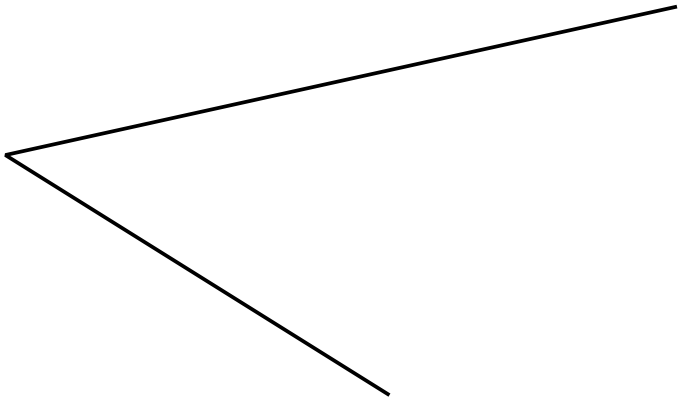
[6 marks]

Question 10

(i) What does the word ***bisect*** mean ?

[1 mark]

(ii) Use a compass and a straight edge to bisect the angle drawn below.
You must show all your construction lines.



[3 marks]

Question 11

Simplify the following expression fully

$$7\,(3x + y) - 5(x - 2y)$$

[2 marks]

Question 12

Eleven gerbils were timed to see how long, in seconds, they took to complete a maze. Their times were as follows

6	13	8	8	7	19
9	6	14	11	6	

(i) What is the mode of the times ?

[1 mark]

(ii) Find the median time.

[2 marks]

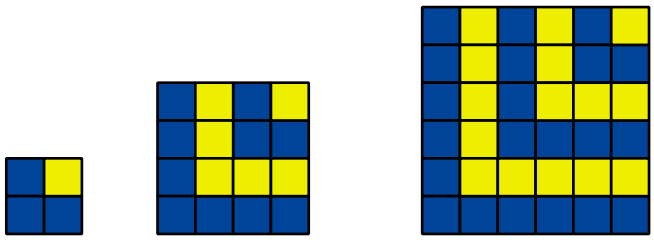
(iii) Calculate the interquartile range of the times.

[2 marks]

(iv) Calculate the mean time taken to complete the maze.

[2 marks]

Question 13



In the first of the above sequence of diagrams the ratio of
blue squares : yellow squares
is 3 : 1

(i) What is the ratio of blue squares : yellow squares in the second diagram ?

[1 mark]

(ii) What is the ratio of blue squares : yellow squares in the the third diagram ?

[1 mark]

(iii) By spotting a connection between the numbers in these ratios and the sequence of triangular numbers, or otherwise, write down the ratios of blue squares : yellow squares for the next three diagrams in the sequence.

_____ _____ _____

[2 marks]