GRAYS TUITION CENTRE – Online Tutoring

WEEK: 15

Week Beginning: (29/06/2020)

Subject: MATHS

Year: 5 (11+)

Lesson Objective:

- Be able to work through topics that often appear in 11plus assessments such as magic squares, co-ordinates and 3D-shapes
- Understand the concept of speed, distance and time
- Be able to calculate speed of a distance time graph

Class Worksheets

- Work through magic squares, co-ordinates and 3D-shapes questions
- Introduction to Speed distance time graph

Homework

- Complete any work not completed in lesson

Additional Notes

- All lesson worksheets and **homework for next week (due Week 16)** worksheets can be found below
- Week 14 homework will be marked in lesson hence make sure it is fully complete

Please print 2 a page or open this document during the lesson to save paper!

Magic Square:

24 In the grid below each number in the middle of a row or column is the average (mean) of the numbers on either side of it.

What value must be placed in the shaded box?

0·2		1·2
1·4		2·2

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15 The grid below is a magic square. Every row, column and diagonal must add to 1·5.

What value must be placed in the shaded box?

		0·2
	0·5	
	0·1	

---

22) One way to make a magic square is to substitute numbers into this algebra grid.

(b) Here is the algebra grid again.

a + b	a – b + c	a – c
a – b – c	a	a + b + c
a + c	a + b – c	a – b

I use **different values** for *a*, *b* and *c* to complete the magic square.

20	21	7
3	16	29
25	11	12

What values for *a*, *b* and *c* did I use?

a = ... *b* = ... *c* = ... (2)

Section B

9	A	
	10	
13	B	

This is a magic square.
All the columns, rows and diagonals add up to 30.
Several numbers have been missed out.

1. What number replaces B?

A	6	B	8	C	7	D	5	E	10

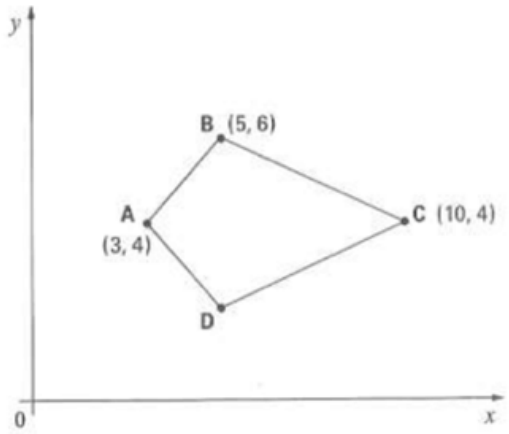
2. What number replaces A?

F	12	G	13	H	14	J	15	K	16

Co-ordinates:

25. The diagram shows the coordinates of three points A, B and C.

Shape ABCD is a kite.



What are the coordinates of point D? (……. , …….) (1 mark)

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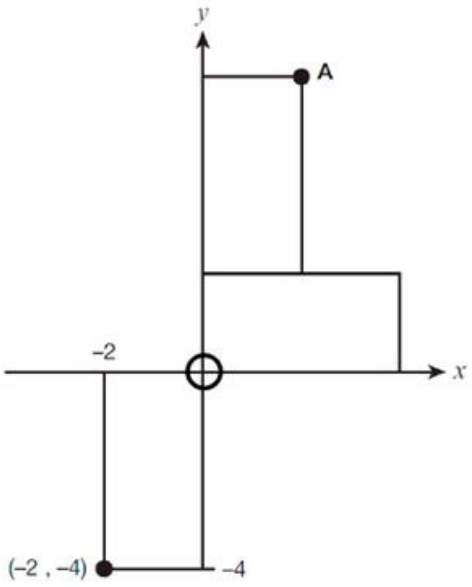
27. Three identical rectangles are drawn.

What are the co-ordinates of A?

(,) (2 marks)



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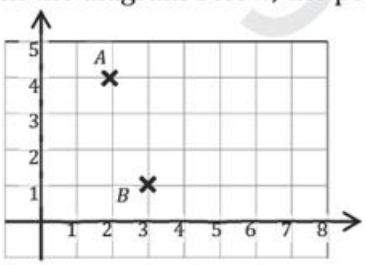
31) In the diagram below, the point A has coordinates (2,4).



(a) Write down the coordinates of point B.

.....[1]

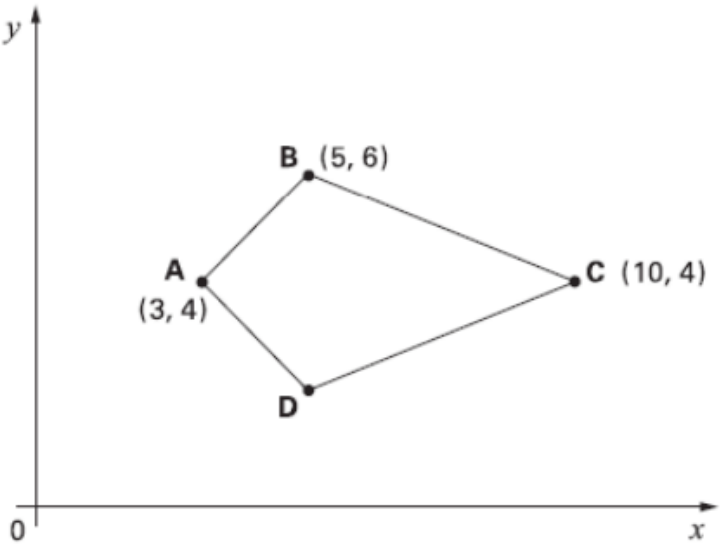
(b) The point C has coordinates (6,2). Mark C on the diagram.

[1]

(c) Add one more point so that the four points make a square. Write down the coordinates of this fourth point and label it D.

.....[2]

24.



ABCD is a kite.
Write down the coordinates of vertex D.

Answer.....

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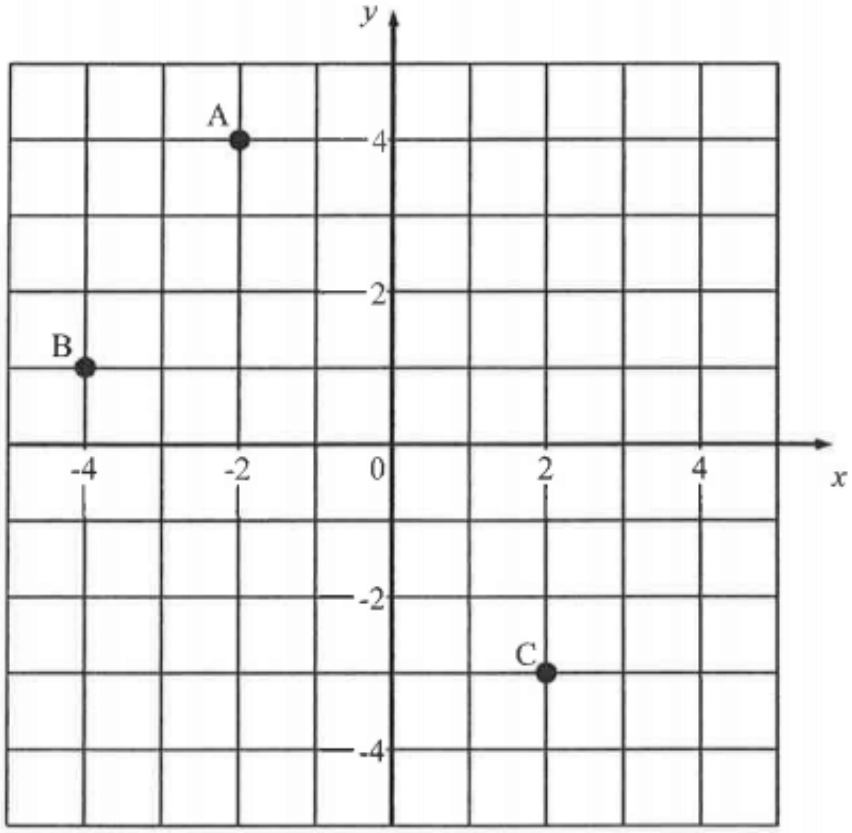
6. The grid below contains three points, labelled A, B and C.
A has co-ordinates (–2, 4) and B has co-ordinates (–4, 1).



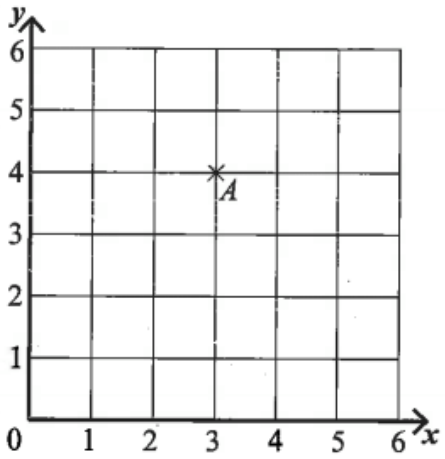
(a) Write down the co-ordinates of the point C.

Answer: C is at (____ , ____)
[2]

(b) Add a fourth point to the grid, labelling it D, so that when they are joined in the order ABCD the four points create a rectangle. Write the co-ordinates of point D below.

Answer: D is at (____ , ____)
[2]

24. Point A has been plotted on the coordinate grid below.



(a) Write down the coordinates of point A.

Answer: (..... , ...)

Point B has coordinates (2, 1).

Point C has coordinates (5, 2).

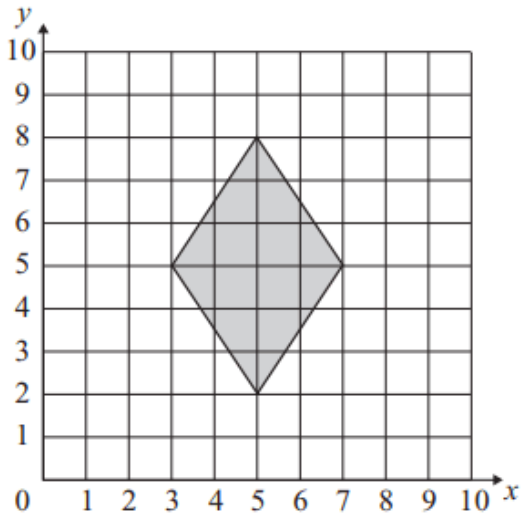
(b) Plot and label points B and C.

Point D can be plotted so that when point A, B, C and D are joined in order, they form a rhombus.

(c) Write down the coordinates of the point D.

Answer: (..... , ...)

38. A rhombus has been drawn on the grid below.



The co-ordinates of three points are listed below.

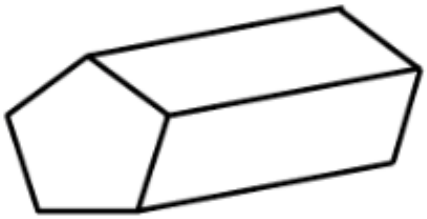
$P(5, 3)$ $Q(5, 9)$ $R(4, 4)$

Write the letter names of the points that lie inside the rhombus.

Answer: .....

3D Shapes:

46. Which name best describes the following 3D shape?



prism pyramid neither of these

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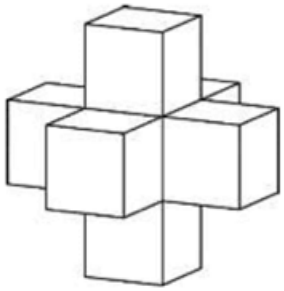
22. A cube has each of its faces covered by one face of an identical cube, making the solid shape shown.



The volume of the solid shape is 875 cm^3.

a) What is the volume of one of the cubes?

……..cm^3 (2 marks)

b) What is the length of one side of a cube?

……..cm (2 marks)

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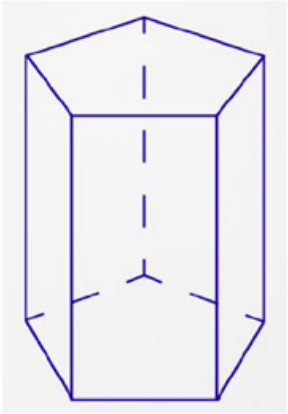
17. The diagram shows a pentagonal based prism.



State the number of

- Faces ……
- Edges ……

[2]

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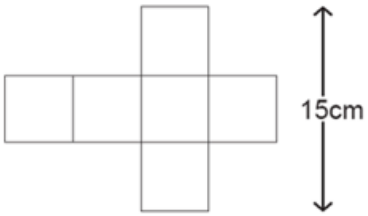
15. In the picture below is the net of a cube. What would be the total surface area of the outside of the cube when the net is made into the cube?



15 cm²

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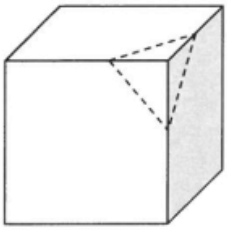
19 A cube has 8 vertices (corners), 6 faces and 12 edges.
Tejan cuts a corner off by sawing through the dotted lines.
How many vertices, faces and edges does the small piece he cut off have?



VERTICES.....

FACES.....

EDGES.....

How many vertices, faces and edges does the big piece left have?

VERTICES.....

FACES.....

EDGES.....

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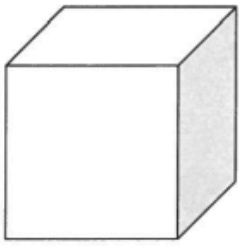
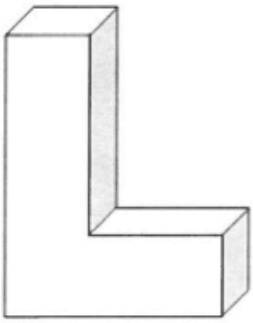
20 A cube has 8 vertices (corners), 6 faces and 12 edges.
How many vertices, faces and edges does the L – shape have?





VERTICES.....

FACES.....

EDGES.....

5

Distance speed time:

28) Julie and Sarika are doing a 24km sponsored walk.

(a) Julie can walk at 6km per hour. How long will she take to finish the walk?

.....[1]

(b) Sarika can walk at 4km per hour. How far will she still have left to walk when Julie finishes?

.....[2]

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7. A top international bowler playing in a cricket match bowls a cricket ball at 90 miles per hour.

(c) How many yards does the ball travel in one second? 7c ____ yards

(d) If the distance the ball travels through the air from the point where the bowler bowls the ball to the point where it is hit by the batsman is 22 yards, how long is the ball travelling for? 7d ____ secs

[8 marks]

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7. A top international bowler playing in a cricket match bowls a cricket ball at 90 miles per hour.

(a) How many miles would the ball travel in one minute? 7a ____ miles

(b) If a mile is 1760 yards, how many yards would the ball travel in one minute? 7b ____ yards

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15. A train travels 80km in 24 minutes. How long will it take to travel 150km?

A: 48 minutes B: $\frac{1}{2}$ hour C: 42 minutes D: 1 hour E: 45 minutes

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Question 1: The distance-time graph shows class 8A's journey to the zoo.
They stopped for a picnic on the way to the zoo.

(a) What time did the bus leave school?

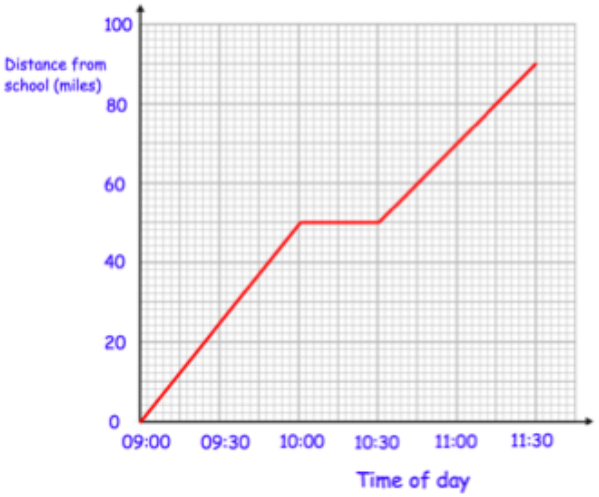
(b) What time did they stop for a picnic?

(c) How far had they travelled when they stopped for a picnic?

(d) How long did they stop for?

(e) What time did they arrive at the zoo?

(f) How far is the zoo from school?



Question 2: Emma travelled to her Grandmother's house and back.
The distance-time graph shows information about her journey.

(a) What time did Emma begin her journey?

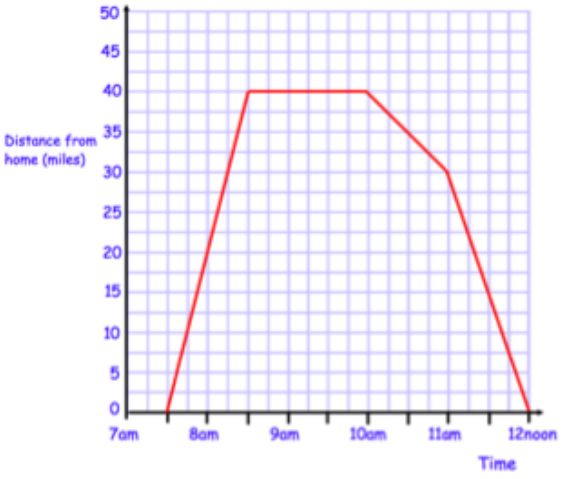
(b) How far was Emma from home at 8am?

(c) How long did Emma stay at her Grandmother's house?

(d) What time did Emma leave her Grandmother's house?

(e) How far was Emma from home at 11:45?

(f) How far did Emma travel in total?



Question 3: A train travels from Milton to Redville, stops for 30 minutes, then travels to Leek.

(a) How long did it take the train to travel from Milton to Redville?

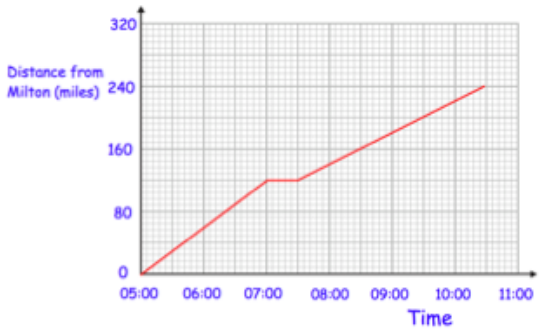
(b) How far is Redville from Milton?

(c) Work out the speed of the train for the journey from Milton to Redville.

(d) How long did it take the train to travel from Redville to Leek?

(e) How far is Leek from Redville?

(f) Work out the speed of the train for the journey from Redville to Leek.

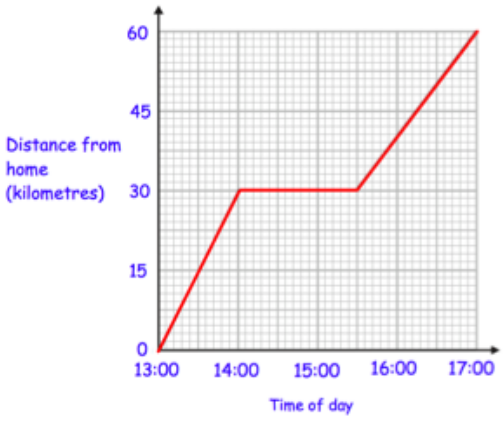


Question 4: Ben drove 60 kilometres, from his home to Liverpool.
He stopped and visited his friend Tim on the way.

(a) Work out Ben's speed for the first part of his journey.

(b) How long did Ben spend visiting Tim?

(c) Work out Ben's speed for the last part of his journey.



17. In a magic square the sum of the numbers in each row, column and diagonal is the same.

The numerals 1 to 9 are used in this magic square.

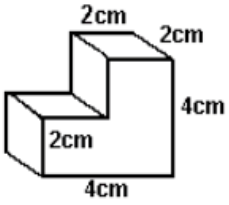
Complete the magic square.

6		2
	5	
8		

4. (a) Find the volume of a cuboid with length 8 cm, width 5 cm and height 6 cm.

Answer _____ [1]

(b) Find the volume of this shape.



Answer . . . . . [2]

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22. James cycles 4000m at 10 metres per second. Tom takes 100 seconds more to cycle the same distance. At what speed does Tom cycle?

Answer: _____ metres per second [3]

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9. Neil drives his car for 20 minutes at 45 kilometres per hour. Stephen does the same journey at a speed of 30 kilometres per hour. How long did it take him?

9	mins

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9. Adam ran 3 kilometres in 13 minutes. Jackie started 30 seconds after him and finished 30 seconds before him. What was Jackie's speed in kilometres per hour?

9	

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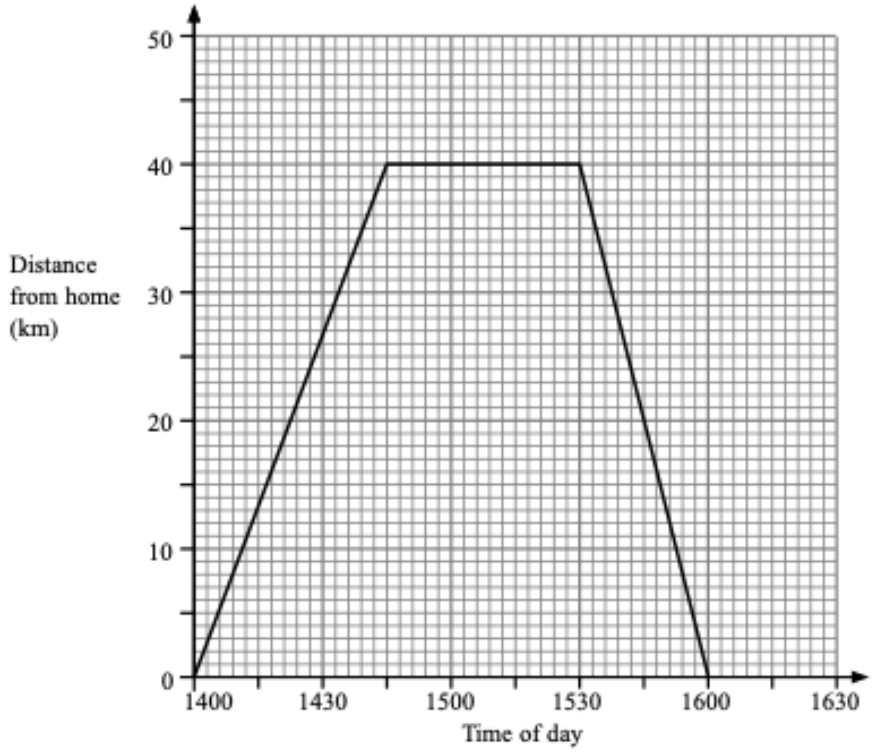
5. Judy drove from her home to the airport.
She waited at the airport.
Then she drove home.
Here is the distance-time graph for Judy's complete journey.



(a) What is the distance from Judy's home to the airport?

..... km

(1)

(b) For how many minutes did Judy wait at the airport?

..... minutes

(1)

(c) Work out Judy's average speed on her journey home from the airport.
Give your answer in kilometres per hour.

..... kilometres per hour

(2)

(Total 4 marks)

HW: Complete any remaining Questions from lesson