Name [Print clearly]	Class:	Mathematics Teacher

Mark Scheme

ACG PARNELL COLLEGE
ACADEMIC COLLEGES GROUP

November 2009 EXAMINATIONS

SUBJECT: Mathematics **YEAR LEVEL :7**

Time allowed:

2 hours **Total Marks: 140**

READ THESE INSTRUCTIONS FIRST

- All your answers and working are to be written on the examination paper.
- **Calculators are permitted.**
- **Show all your working.**
- Answer **all** questions.
- The number of marks is given in [ ] at the end of each question or part question.

Section	Total	Mark
Semester 1	40	
2D Geometry	10	
Probability	10	
Statistics	15	
Measurement	15	
Time	15	
3D Geometry	10	
Transformations	10	
Problem Solving	15	
TOTAL	140	

Nick T. +1 40
Sam E +2 77
Nick C +1
Alexis – 51%
Meg – 71%
Jarah +1
Ryan +1
Malcolm +1
Charlotte +1
Robert +2
Elise +1
Alec +1
Matt +1 65

This document consists of 22 printed pages

Semester One

1. At a Mylie Cyrus concert there were 25 470 tickets sold.
   a) Round this number to the nearest 100.

25500 [1] ✓

   b) If the tickets for the concert cost $23 each, what was the total cost of all of the tickets?

$23 × 25470

$585810 [1] ✓

   c) 70% of the people at the concert were female. How many were male?

25470 × 0.3

7641 [1] ✓

   d) Two thirds of the concert goers bought souvenir CD's. How many CD's were sold (full working must be shown to get marks)

25470 ÷ 3 × 2 ✓

16980 [2] ✓

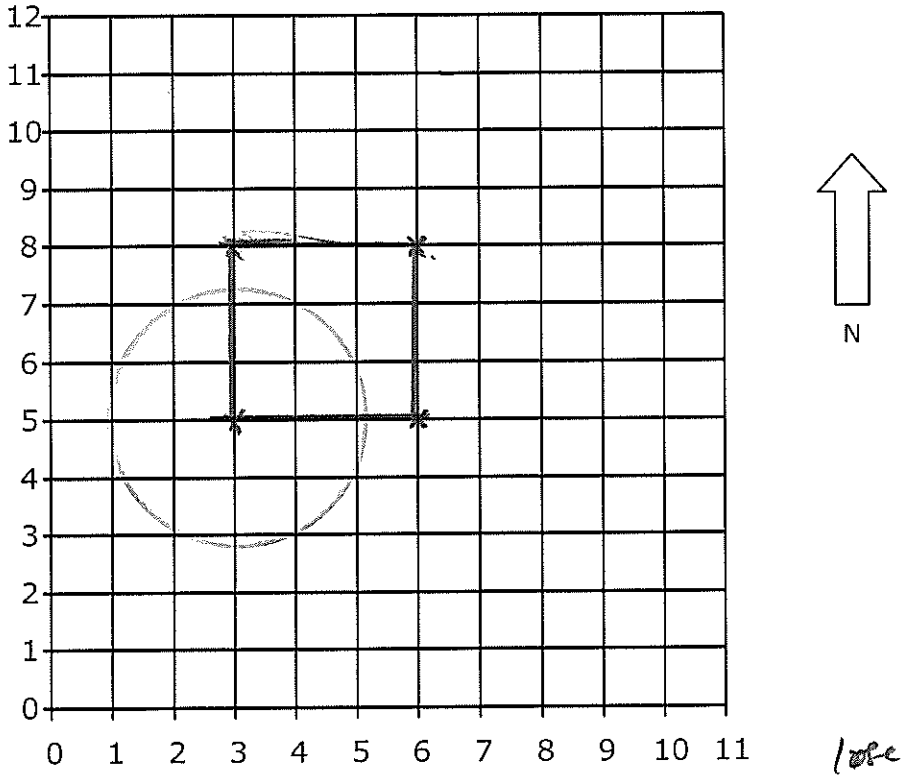
2. Place the numbers 1 to 10 (inclusive) into the correct boxes below.
   Numbers can be used more than once. [4]

Prime numbers	2 3 5 7 ✓
Multiples of 4	4 8 ✓
Factors of 18	1 2 3 6 9 ✓
Composite numbers	4 6 8 9 10 ✓

9

3.

a) Starting at the point (3,5) draw a square by drawing a line 3 units long to the East of the point , then another line 3 units long heading North. Now complete the square. [1]



lose $\frac{1}{2}$ mark if no bracket

b) Give the coordinates of each of the vertices.

(3,5) (6,5) (6,8) (3,8) [3]

c) If each unit on the grid represents 2 metres, what are the dimensions of the square you have drawn?

6m × 6m [2] must have unit

d) Using the same scale as in part (c), accurately draw the locus of all points that are 4 metres from the point (3,5). [2]

1 mark for circle
1 mark for accuracy

4. Rudolph has an after school job and is paid $20 a week.

a) He has to pay 10% tax on his $20 pay which is **taken out** **before** his weekly pay is deposited into the bank. How much is deposited in the bank each week?

$20 \times 0.1 = 2$ $20 - 2$ ✓

$18 ✓ [2]

b) He saves 7/9 of his pay and spends the rest on lollies each week. How much does he spend on lollies each week?

$18 \div 9 \times 7 = 14$ ✓

$18 - 14 =$

$4 ✓ [2]

c) Rudolph is saving up to buy an IPOD which costs $285. How many weeks of saving will it take him before he has enough to buy the IPOD ?

$14\overline{)285}$ 20.35 ✓

21 ✓ [2]

5. Complete the sentences by writing in an appropriate word. [3]

a) The product of 2 numbers is the answer to a multiplication problem. ✓

b) The sum of two numbers is the answer to an addition problem. ✓

c) To find the difference between two numbers you have to subtract them ✓ from each other.

6. Two boys, Jacob and Hansel entered an apple eating competition. Jacob managed to eat ¾ of an apple in 5 seconds and Hansel ate $\frac{5}{6}$ of an apple in the same time. Both of them thought they had won. **Show** which one of them really ate more in the time.

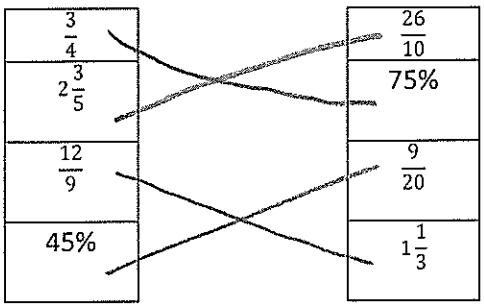
$\frac{5}{6} = \frac{10}{12}$ H ✓ $\frac{3}{4} = \frac{9}{12}$ J.

no working no marks

✓ Hansel [2]

11

7. Match the fraction cards into their correct pairs by drawing a line between them. [4]



8. A sports team are all weighed, 3 of the team weigh 56.355kg, 2 weigh 67.45kg and one weighs 60.5kg. Calculate the team's total weight. (full working must be shown)

56.355 x 3 = 169.065
67.45 x 2 = 134.9 ✓
60.5 = 60.5
364.465 ✓

364.465 [2]

9.

a) A house plan shows a scale of 1:200. On the plan the lounge measures 7cm X 5.2cm. What are the actual dimensions of the lounge?

7 x 200 = 1400 cm
5.2 x 200 = 1040 cm.
no units loose 1 mark.

1400cm ✓ by 1040 cm. ✓ [2]

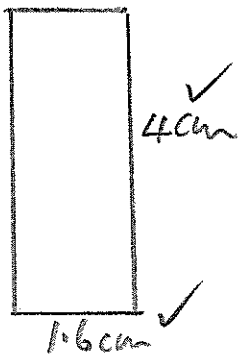
b) A large carpet square measures 5m by 4.5m. Using the same scale of 1:200 what would be the dimensions of the carpet drawn on the house plans?

500 ÷ 200 = 2.5 cm
450 ÷ 200 = 2.25 cm
0.025m x 0.0225 m.
or ✓ must have units

2.5cm ✓ by 2.25cm [2]

e) Draw an accurate scale drawing of a door that is 2 metres high and 0.8 metres wide using a scale of 1:50. [2]

200 ÷ 50 = 4 cm
80 ÷ 50 = 1.6cm



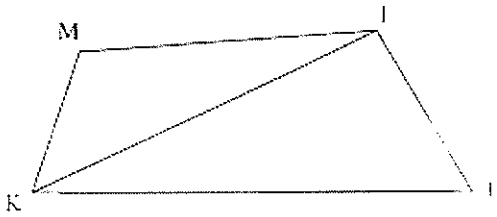
/12

2D Geometry

10. Fill in the blanks:

In a regular polygon all of the sides ✓ are the same length and all of the angles ✓ are the same size [2]

11. Answer these questions from the polygon shown:



a) Using 3 point notation name an obtuse angle.

KML [1]

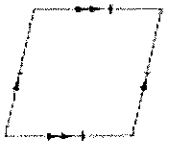
b) Name a side of the polygon

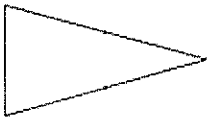
MK [1]

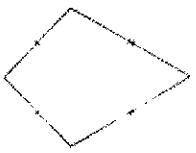
c) Name the vertex where MK and JK intersect.

K [1]

12. Name each of the polygons drawn: [3]





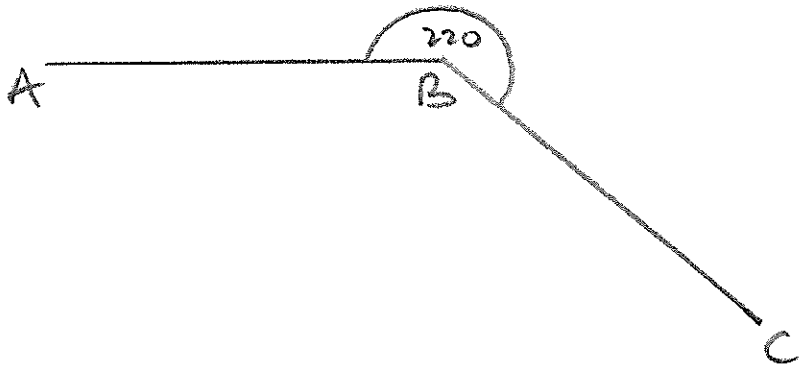


a) Rhombus ✓ b) Isosceles Δ ✓ c) kite ✓

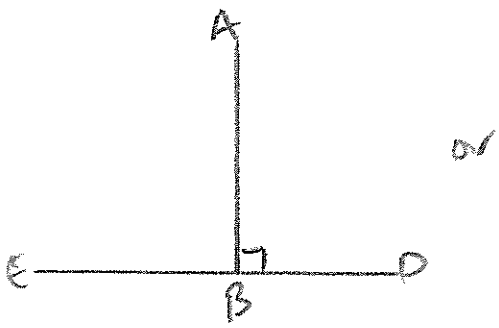
/8

13.

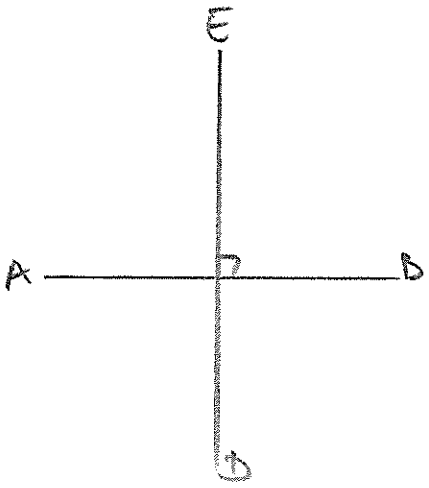
a) Draw a 220° angle and label it using 3 point notation ABC [1]



14. Draw a sketch to show $\overline{AB} \perp \overline{ED}$ [1]



or



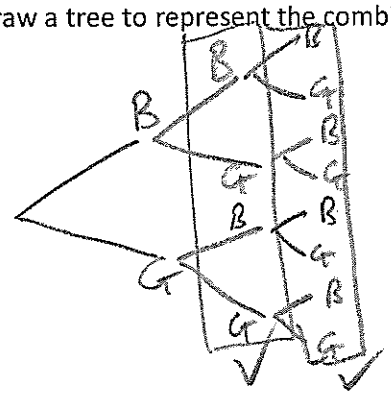
needs to show that the angle is 90°

2

Probability

15. The Francis family have three children.

a) Draw a tree to represent the combinations of boys and girls possible. [2]



1 mark for correct 2nd child

1 mark for correct 3rd child

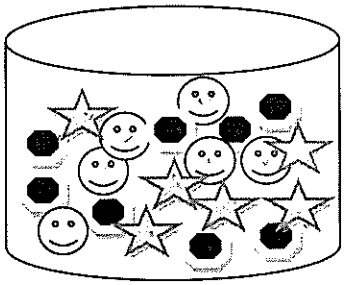
b) List the possible outcomes where birth order matters. [2]

4 correct ✓
2 correct ✓✓

BBB BBG BGB BGG GBB GBG

GGB GGG

16. Alice's jar contains three different types of sweets, Smilieys, Stars and Octagons.



20

a) What is the probability of picking a Star at random?

$\frac{6}{20}$ [1]

b) If Alice ate one Star, what would the probability be of picking a Smiley next?

$\frac{6}{19}$ ✓ [2]

7

17. A class survey showed that out of the 25 students, 10 had Vodafone mobiles, 8 had Telecom mobiles, 3 had Next mobiles and the rest didn't have a mobile.

a) What is the probability that someone in the class has a Telecom mobile?

$\frac{8}{25}$ [1]

b) Using the same probabilities as the class survey, how many students would you expect to have Vodafone mobiles in a school of 800 students?

$\frac{10}{25}$ $800 \div 25 \times 10$ ✓

✓

320 [2]

3

Statistics

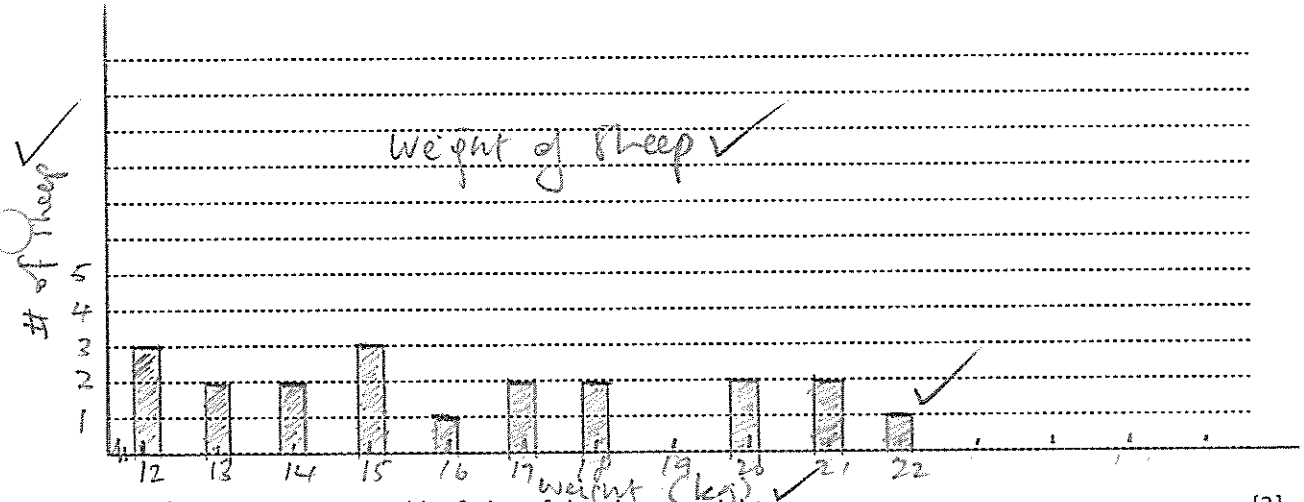
18. Below are the weights in kilograms of 20 sheep:

15 17 18 15 12 13 14 15 21 17 12 12 18 20 22 21 16 14 20 13

a) Draw a tally table and frequency chart of the sheep weights. [3]

	Tally	Freq
12	III	3
13	II	2
14	II	2
15	III	3
16	I	1
17	II	2
18	II	2
19		0
20	II	2
21	II	2
22	I	1

b) Use your table to draw a bar chart of the sheep weights. [4]



c) Draw a stem and leaf plot of the sheep weights [3]

If leaves not in order lose 1 mark

1	2 2 2 3 3 4 4 5 5 5 6 7 7 8 8
2	0 0 1 1 2

10

d) What is the average weight of the sheep?(working must be shown)

$36+26+28+45+16+34+36+40+42+22$

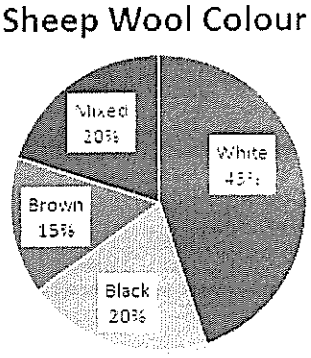
$= 325$

$325 \div 20 =$

16.25 ✓

_____[2]

19. The Pie Graph of Sheep Wool Colour has been made from counting a flock of 600 sheep :



a) How many brown sheep are there in the flock?

600×0.15 ✓

90 ✓

_____[2]

b) What fraction of the flock is **not** White?

$\frac{55}{100}$ or $\frac{11}{20}$

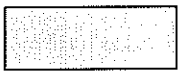
$\frac{11}{20}$ or $\frac{55}{100}$ ✓

_____[1]

5

Measurement

20. Find the perimeter and area of the rectangle shown.



3+3+11+11 = 28

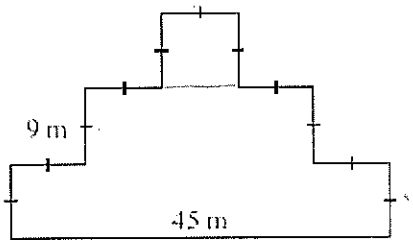
perimeter 28 cm [1]

3×11 = 33

area 33 cm² [1]

½ mark if no unit

21. Find the perimeter and area of the shape shown.



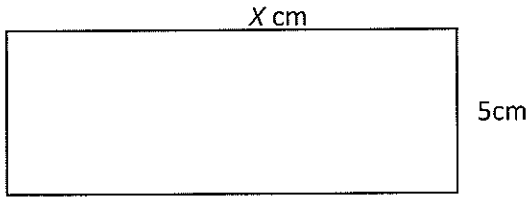
99+45 =

perimeter 144 m [1]

9×9 + 9×27 + 9×45 =

area 729 m² [2]

22. Find the missing length in the rectangle if the area of the rectangle is 60 cm². (working must be shown)



60 ÷ 5 = 12 cm

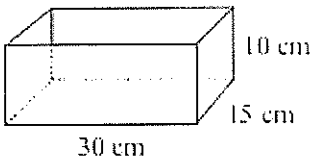
12 cm [2]

23. Find the length of one side of a square if the perimeter of the square is 64cm

16 [1]

24.

a) Calculate the volume of the box.
(show full working)



30 x 15 x 10 =

4500 cm³ ?

_____ [2]

b) How many litres can the boxhold.

4500 cm³ = 4500 mL = 4·5 L.

4·5 L. [1]

25.

a) Convert 12cm to the units given [2]

12 cm	120 mm ✓	0·12 m ✓

b) Convert 5kg to the units given [2]

5kg	5000 g ✓	0·005 t ✓

/7.

Time

26. How many hours are there in 2 weeks 3 days?

7 × 2 = 14 days
17 days × 24 =

408 [1]

27. Mr Jessopp catches a plane to Hawaii at 1324 hours.
    a) What is the time in 12 hour time?

1.24pm [1]

    b) If the flight takes ten hours and fifty two minutes, what time is it in New Zealand when it arrives in Hawaii?

1.24pm + 10hrs 52 min

12.16am / 0016 [1]

    c) Hawaiian time is 23 hours behind New Zealand. What time does the flight arrive in Hawaiian time?

01.16am 0116 [1]

28. Ms Perrin decides to drive from Auckland to Invercargill.
    a) How long does it take her if she leaves at 11.43am on Sunday and arrives in Invercargill on Tuesday at 4.15pm?

11.43(S) → 24 → 11.43am (M) → 24 → 11.43am (T) → 17min → 12pm (T) → 4hr 15min → 4.15 (T)

52hrs 32min [2]

    b) If Ms Perrin slept for 8 hours on Sunday night, 6 hours on Monday night and also had 9 twenty minute stops during the journey, how much actual driving time did Ms Perrin have?

8 + 6 = 14hrs
9 × 20 = 180min = 3hrs
14 + 3 = 17hrs
52hrs 32min − 17hrs

35 hrs 32 mins [2]

8

29. Below is a bus timetable from Auckland to Otorohanga:

Coach Stop		Arrives	Departs
Auckland			9:00 am
Manukau City		9:14 am	9:15 am
Papakura	★	9:29 am	9:30 am
Bombay	★	9:44 am	9:45 am
Pokeno	★	9:54 am	9:55 am
Rangiriri	★	10:14 am	10:15 am
Huntly	★	10:24 am	10:25 am
Taupiri	★	10:29 am	10:30 am
Ngaruawahia		10:34 am	10:35 am
Hamilton	T - 6501	11:00 am	11:35 am
Rukuhia	★	11:38 am	11:39 am
Ohaupo	★	11:43 am	11:44 am
Te Awamutu		11:59 am	12:00 pm
Kihikihi		12:04 pm	12:05 pm
Te Kawa Crossroads	★	12:09 pm	12:10 pm
Otorohanga		12:24 pm	12:25 pm

a) How long is the trip from Auckland to Rukuhia?

2hrs 38min [1]

b) Where is the longest stop on the trip?

Hamilton. [1]

c) How long is this stop?

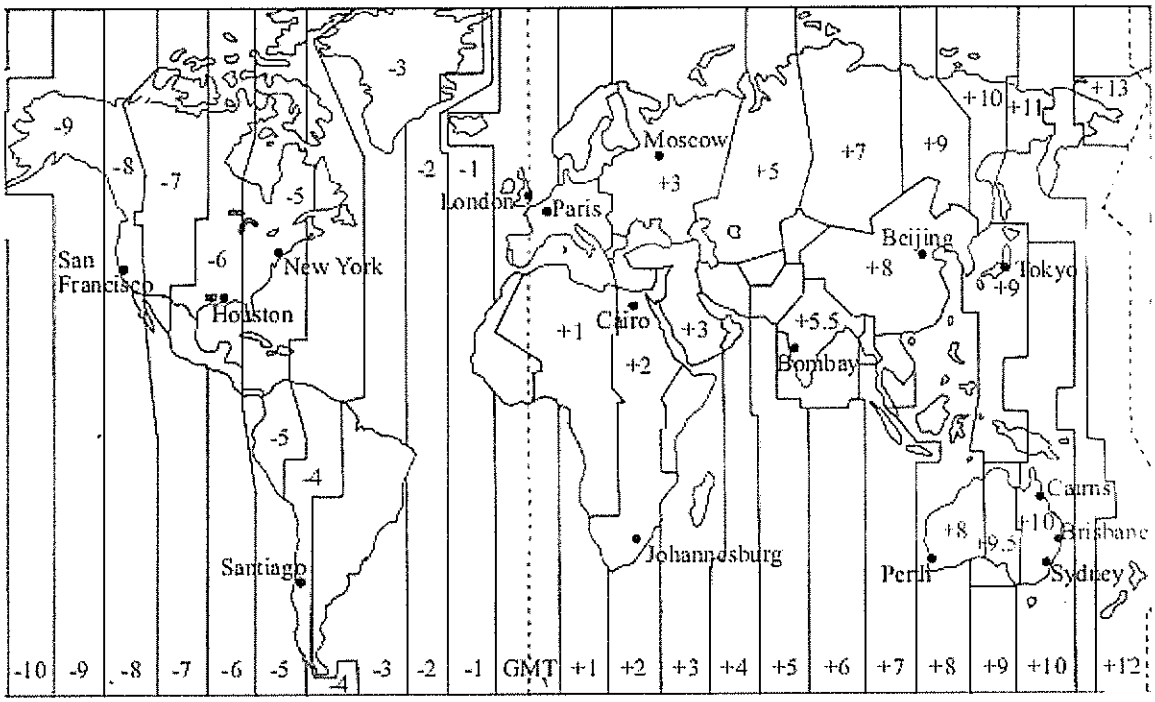
35 min [1]

d) How long does it take the bus to go from Pokeno to Ohaupo?

1hr 49min [1]

4

30.



Using the world time zone map above:

a) How many hours is Santiago ahead or behind New Zealand time?

17hr [1]

b) Find the time in London when it is 5pm in New Zealand.

5am [1]

c) If it is 0630 in Paris what time is it in San Francisco?

0630
- 8

2230 [1]

3

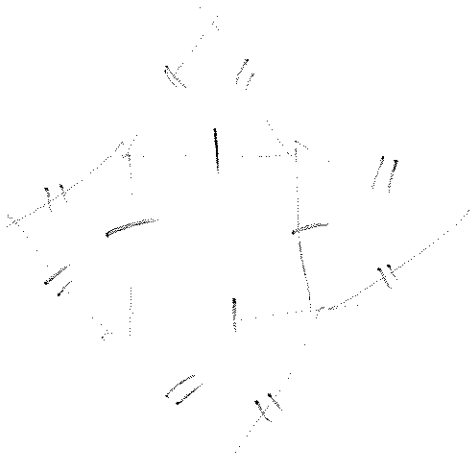
3D Geometry

31. Complete the sentences:

a) A prism has a uniform cross section [1]

b) All of the triangular faces of a pyramid meet at one vertex/point. [1]

32. Draw a neat net of a square based pyramid.



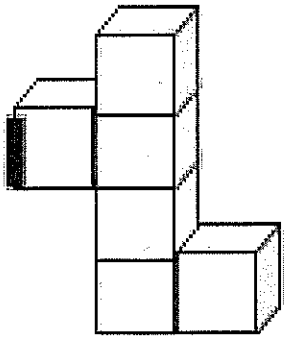
correct net ✓
accurately drawn ✓
length of sides shown ✓

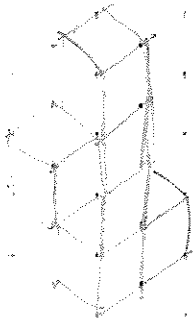
[3]

33. Draw the shape below as an isometric projection on the dotty paper with the dark edge as the first line.

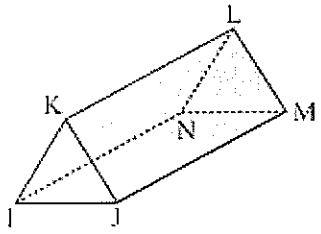
correct orientation ✓
correct drawing ✓

[2]





34.



a) Name <u>one</u> vertex from the figure above.

_____[1]

b) Name <u>one</u> edge.

_____[1]

c) Name <u>one</u> face.

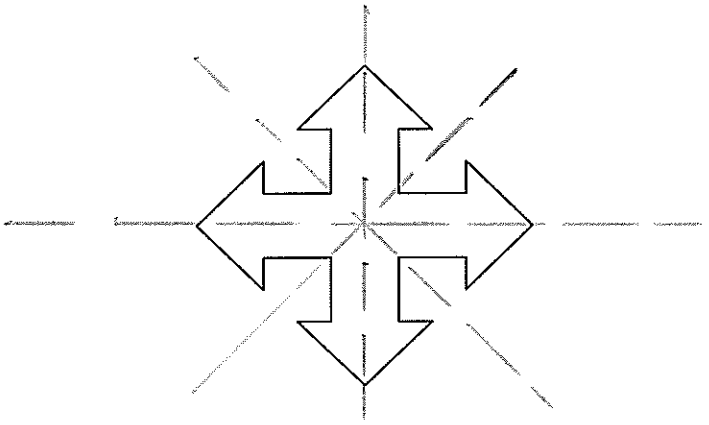
_____[1]

3

Transformations

35.

a) Draw in all of the lines of symmetry for this shape. [2]



½ mark mark for each line

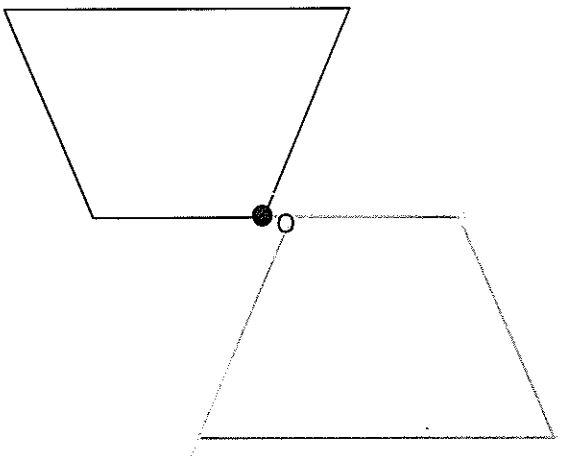
b) How may times would the figure map onto itself through a 360° rotation?

4 [1]

39. Rotate the figure below, 180 degrees clockwise about the centre marked with O and draw in the rotated image marking it A'. [2]

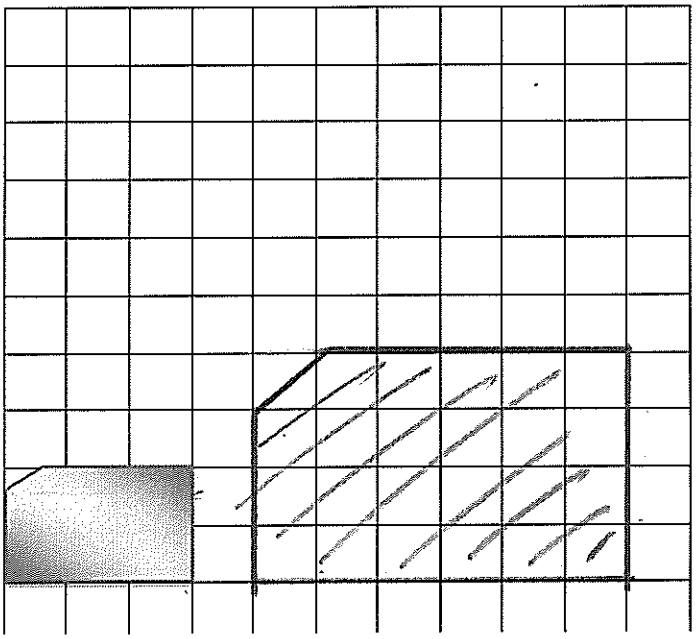
1 mark for correct rotation

1 mark for accuracy.



5

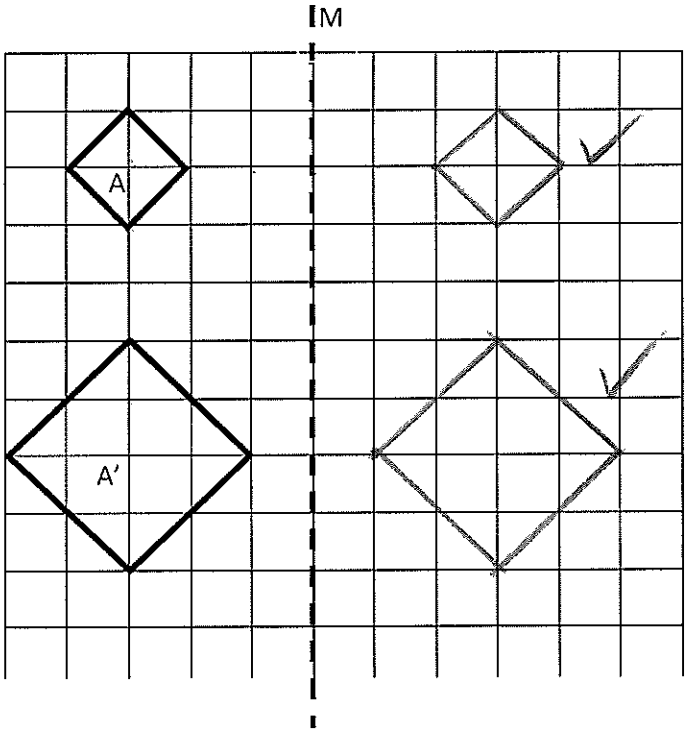
40. Enlarged the figure by scale factor of 2. [2]



41.

a) In the diagram A has been enlarged to A'. What is the scale factor?

2 [1]



b) Reflect A and A' in the mirror line M [2]

5

Problem Solving

42. Edna bought 48 packets of red balloons, 66 packets of blue balloons and 35 packets of yellow balloons. Each packet cost $3 and contained 12 balloons. She mixed them up and gave away 213 balloons. Then she repacked the remainder into packets of 25 balloons each.

a) How many balloons did Edna buy altogether?

48 + 66 + 35 = 149
149 × 12 =

1788 [1]

b) How many packets of balloons did she have when she had finished repacking?

1788 − 213 = 1575
1575 ÷ 25 =

63 [2]

c) If she sold each repacked pack of balloons for $10 each, how much money did she make?

63 × 10 = $630
149 × 3 = $447
630 − 447 = $183

$183 [2]

43. Jane filled the biscuit jar when her 3 children went to bed. That night one child woke up and ate half of the biscuits, then went back to bed. Later the second child woke up and ate half of the remaining biscuits and then went back to bed. Finally the third child woke up and ate half of the remaining biscuits leaving 3 cookies in the jar. How many biscuits were in the jar to start with?

3 × 2 = 6
6 × 2 = 12
12 × 2 = 24

24 [2]

44. Ms Match went to a store, spent half of her money and then $10 more. She went to a second store, spent half of the money she had left and then $10 more. She then had no money left. How much did Ms Match have when she started out?

$20 + 10 = $30
$30 × 2 = $60

$60 [2]

last store 10 + 10 = 20
first (20 + 10) × 2 = 60 → ½ of 60 + 10 = 40
spend 40 then 20 left
½ of 20 = 10 + 10 = 20

45. Henry's sister is 3 years younger than Henry. The product of their ages is 180. How old is Henry?

180: 18, 10
15, 12

15 ✓ [1]

46. The Cyclone Rollercoaster has 16 cars. Some of them hold 2 passengers and some hold 3 passengers. If there is room for 36 people altogether, how many cars hold 3 passengers?

2	3	
10×2	6×3	38
11×2	5×3	37
12×2	4×3	36 ✓

4 ✓ [2]

47. A train left town with 121 passengers. At the first stop 1 person got off. At the second stop 3 people got off. At the third stop 5 people got off. At the fourth stop 7 people got off. If this pattern continues :

a) How many people will get off at the 7th stop?

1, 3, 5, 7, 9, 11, 13

13 [1]

b) How many stops will the train have made when all of the passengers are off?

1 3 5 7 9 11 13 15 17 19 21
1 4 9 16 25 36 49 64 81 100 121

11 [2]

16