Write your name here

Surname Model Solutions | Other names

Pearson Edexcel
International GCSE

Centre Number | Candidate Number

Mathematics A

Level 1/2
Paper 2F

Foundation Tier

Sample assessment material for first teaching September 2016
Time: 2 hours

Paper Reference
4MA1/2F

You must have:
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
  Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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.
- Check your answers if you have time at the end.

Turn over ▶

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1/1/2/

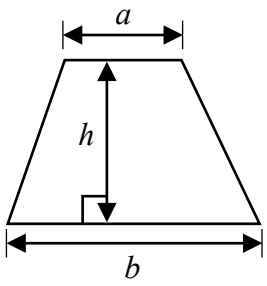
S 5 1 8 3 1 A 0 1 2 4

PEARSON

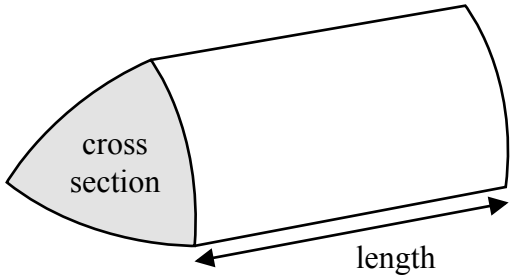
International GCSE Mathematics

Formulae sheet – Foundation Tier

Area of trapezium = $\frac{1}{2}(a + b)h$

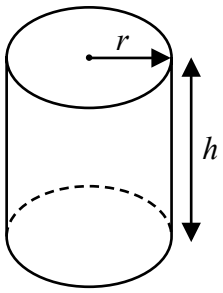


Volume of prism = area of cross section × length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1 The table shows the distance from Delhi to each of six cities.

City	Distance (km)
Bengaluru	2061
Chennai	2095
Hyderabad	1499
Kolkata	1461
Mumbai	1407
Pune	1417

(a) Which number in the table is the smallest number?

1407

(1)

(b) Which number in the table is a multiple of 5?

ends in 5 or 0

2095

(1)

(c) Write down the value of the 6 in the number 1461

1461 = 1000 + 400 + 60 + 1

60

(1)

(d) Write the number 1499 correct to the nearest thousand.

4 < 5 round down

1000

(1)

(Total for Question 1 is 4 marks)

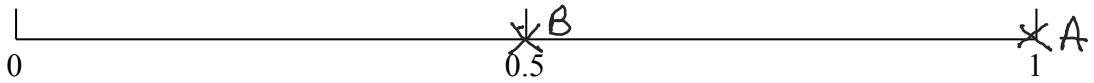
2 On the probability scale, mark with a cross (×) the probability that

(a) a fair 6-sided dice will land on a number less than 7 ← All numbers on a dice are less than 7
Label this cross **A**.

(1)

(b) a fair 6-sided dice will show an even number when thrown.
Label this cross **B**. - 3 even, 3 odd — 50:50 chance

(1)



(Total for Question 2 is 2 marks)

3 The table shows midday temperatures in five cities one day in winter.

City	Midday temperature (°C)
Paris	2
Cardiff	–5
London	–3
Edinburgh	–1
Berlin	–8

(a) Which city had the lowest midday temperature?

lowest = −8°C

Berlin

(1)

The midday temperature in Exeter is 6°C higher than the midday temperature in Cardiff.

(b) Work out the midday temperature in Exeter.

Cardiff : −5
−5 + 6 = 1

1 °C

(1)

By midnight, the temperature in London had fallen by 4°C.

(c) Work out the midnight temperature in London.

London : −3
−3 − 4 =

−7 °C

(1)

The midday temperature in Glasgow is halfway between the midday temperature in Paris and the midday temperature in Berlin.

(d) Work out the midday temperature in Glasgow.

Paris = 2
Berlin = −8

$\frac{2 + -8}{2} = \frac{-6}{2} =$

−3 °C

(2)

(Total for Question 3 is 5 marks)

4 There are 30 counters in a bag.
1 of the counters is yellow. 1/30
The rest of the counters are either blue or green.

Sharita takes a counter from the bag at random.

(a) Write down the probability that she will take

(i) a yellow counter

1 yellow / 30 total

$\frac{1}{30}$

(1)

(ii) a red counter

No red so P(red) = $\frac{0}{30}$

0

(1)

The probability that Sharita will take a blue counter from the bag is $\frac{3}{10}$

(b) Find the probability that she will **not** take a blue counter.

P(Blue) = 3/10

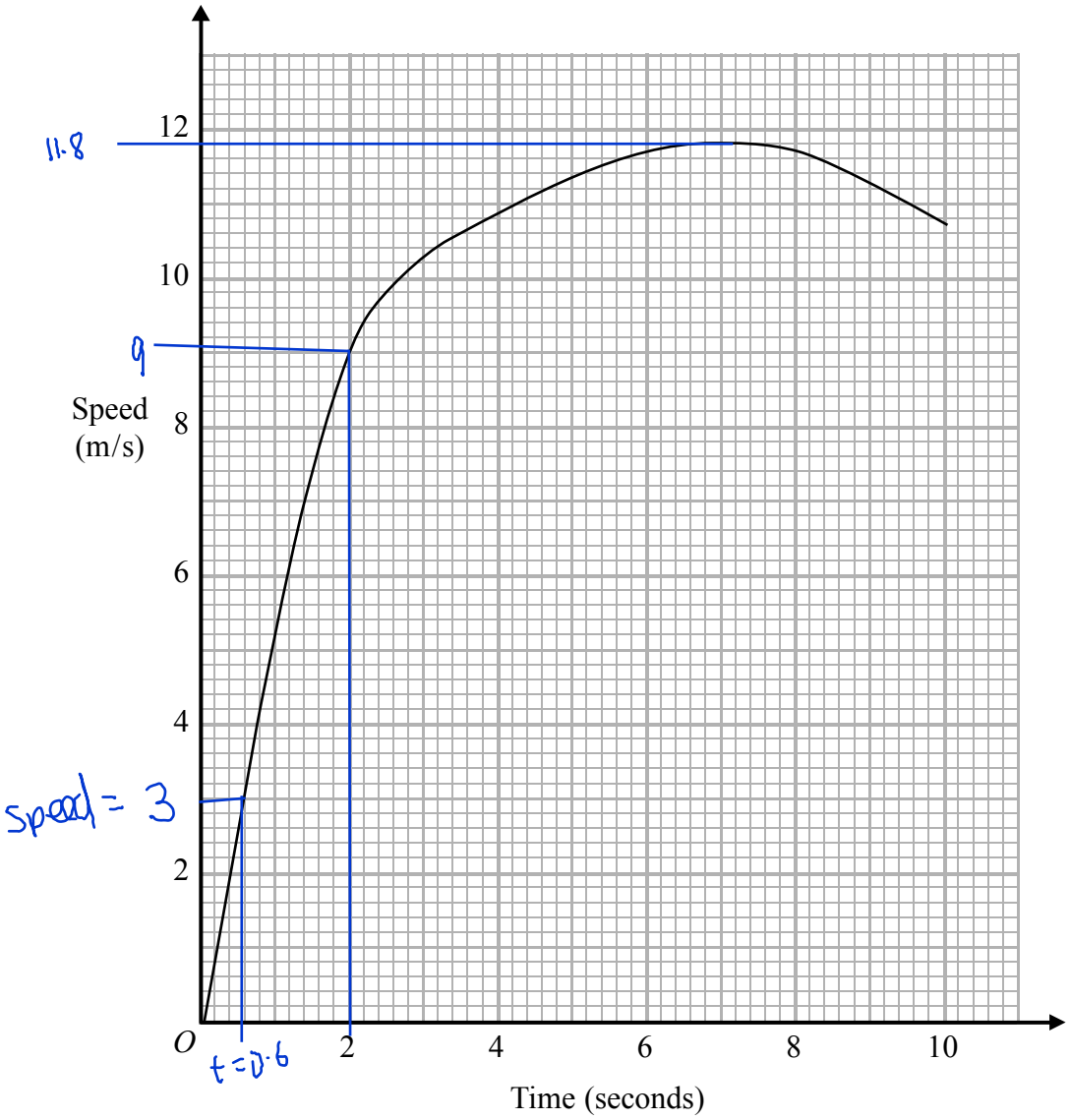
P(Not Blue) = $1 - \frac{3}{10} = \frac{10}{10} - \frac{3}{10} =$ $\frac{7}{10}$

Total probability

(1)

(Total for Question 4 is 3 marks)

5 Jason runs in a race.
The graph shows his speed, in metres per second (m/s), during the first 10 seconds of the race.



(a) Write down Jason's speed at 2 seconds.

9 m/s

(1)

(b) Write down Jason's greatest speed.

11.8 m/s

(1)

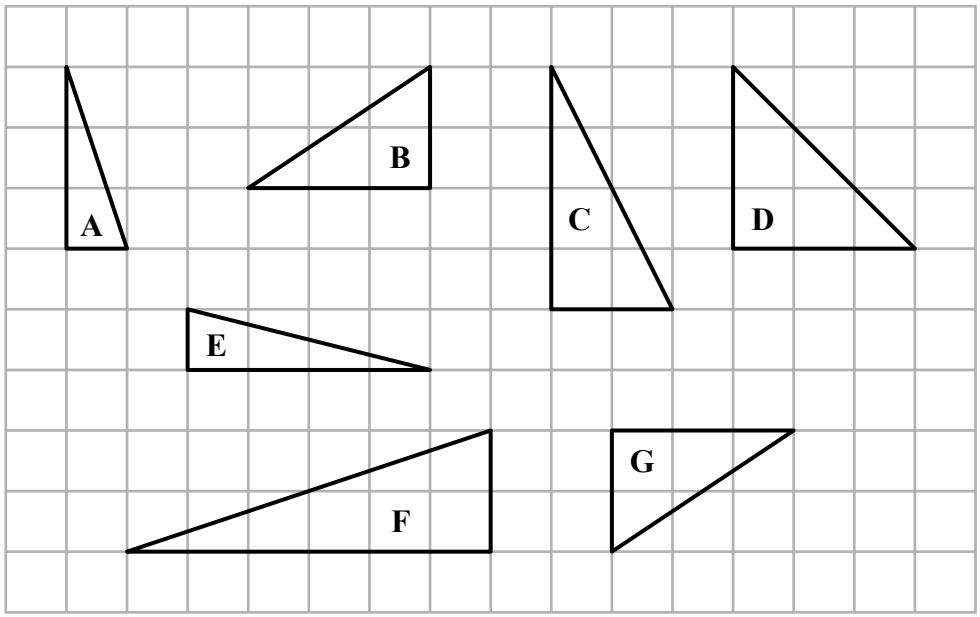
(c) Write down the time at which Jason's speed was 3 m/s.

0.6 seconds

(1)

(Total for Question 5 is 3 marks)

6 Here are seven triangles drawn on a square grid.



(a) Write down the letters of the two triangles that are congruent.

identical in form but can be rotated/reflected

B , G

(1)

(b) One of the triangles is similar to triangle **A**.
Write down the letter of this triangle.

Angles are equal but lengths are multiplied by a scale factor

F

(1)

(c) One of the triangles is isosceles.
Write down the letter of this triangle.

Base angles and 2 lengths are equal

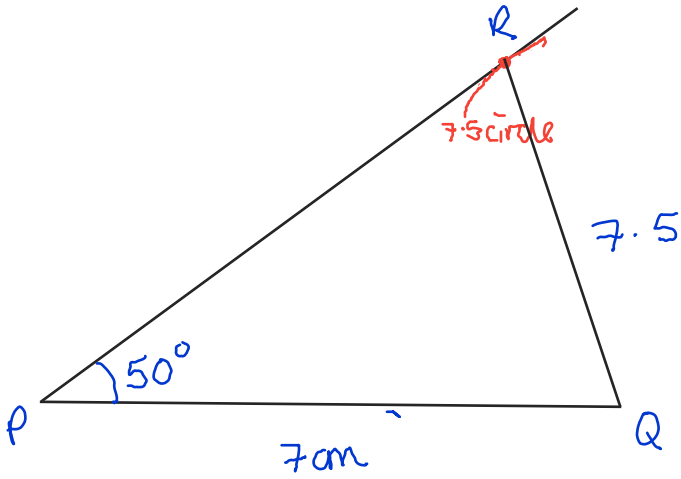
D

(1)

(Total for Question 6 is 3 marks)

7 PQR is a triangle.
$PQ = 7$ cm and $QR = 7.5$ cm.
Angle $QPR = 50°$

Draw accurately the triangle PQR with PQ as its base.



Not to scale

(1) Draw base
(2) Draw angle 50°
(3) Draw circle radius 7·5cm centre Q
(4) Mark R where 2 + 3 intersect

P ——————— Q

(Total for Question 7 is 2 marks)

8 (a) Find the value of $\sqrt{46.24}$

in calc

6·8

(1)

(b) Find the value of 9^3

9x9x9

729

(1)

(c) Find the cube root of 19.683

$\sqrt[3]{19.683}$ in calc

2.7

(1)

(Total for Question 8 is 3 marks)

DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA DO NOT WRITE IN THIS AREA

9 (a) Simplify $3m + 2m - m$

$3+2-1=4$

$4m$

(1)

(b) Simplify $6k \times 3p$

$6 \times 3 \times kp =$

$18kp$

(1)

(c) Solve $7e = 28$

$\div 7$

$e = 4$

$e =$ 4

(1)

$P = 4r - 3q$

(d) Work out the value of P when $r = -7$ and $q = 5$

$P = 4(-7) - 3(5)$

$= -28 - 15$

$P =$ -43

(2)

$P = 4r - 3q$

(e) Work out the value of r when $P = 9$ and $q = 8$

$9 = 4r - 3(8)$

$9 = 4r - 24$

$+24$

$33 = 4r$

$\div 4$

$33/4 = r$

$r =$ $33/4$

(3)

(f) Factorise $5c + 30$

1

5 is a factor in both

$5c \div 5$

r

$30 \div 5$

$5(c+6)$

$5(c+6)$

(1)

(Total for Question 9 is 9 marks)

10 Umar buys 7 first-class tickets and 9 second-class tickets for the train journey from Colombo to Kandy.
The total cost is 4500 Sri Lankan rupees.
The cost of each first-class ticket is 360 Sri Lankan rupees.

(a) Work out the cost of each second-class ticket.

$7 \times \text{first class} + 9 \times \text{second class} = 4500$

$7 \times 360 + 9\,sc = 4500$

$2520 + 9sc = 4500$

-2520

$9sc = 1980$

$\div 9$

$sc = 220$

220 Sri Lankan rupees

(3)

The train left Colombo at 16:55
The train arrived in Kandy at 20:15

(b) How long did the train take to get from Colombo to Kandy?

16:55 → 17:00 = 5min
17:00 → 20:00 = 3hour +
20:00 → 20:15 = 15min

3h 20min

(2)

(Total for Question 10 is 5 marks)

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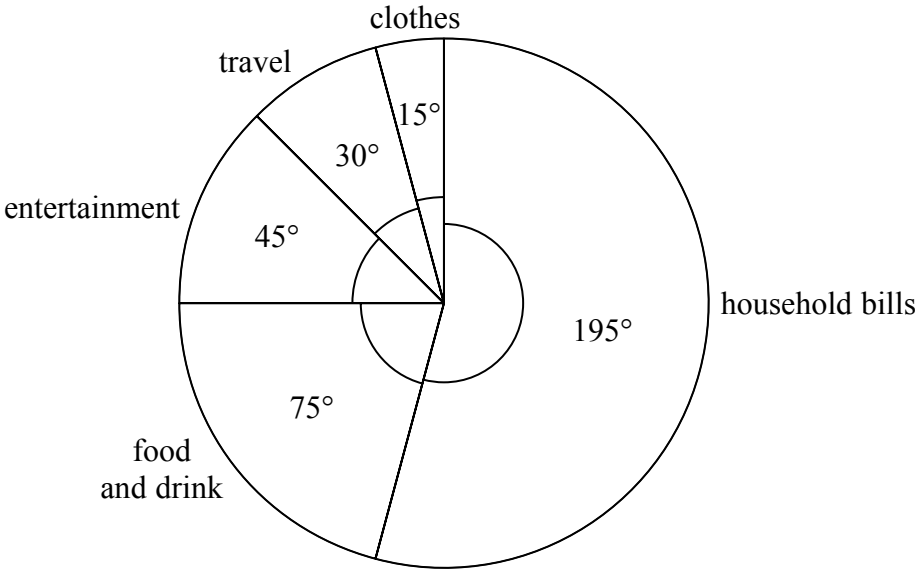
11 The pie chart shows information about Andrew's spending last month.



Andrew spent $80 on travel last month.

(a) Work out the amount Andrew spent on household bills last month.

÷30 → 30° = $80 → ÷30
→ 1° = $8/3
× 195 → 195° = $520 → ×195

household degree ✓

$ 520

(3)

A second pie chart is to be drawn for Cathy's spending.
Cathy spent a total of $800 last month.
She spent $120 on entertainment last month.

(b) Calculate the size of the angle for entertainment in the second pie chart.

Proportion = $\frac{\$120}{\$800}$ = 0.15

Degree = 0.15 × 360 =

54 °

(2)

(Total for Question 11 is 5 marks)

12 The diagram shows the floor plan of a room in Kate's house.

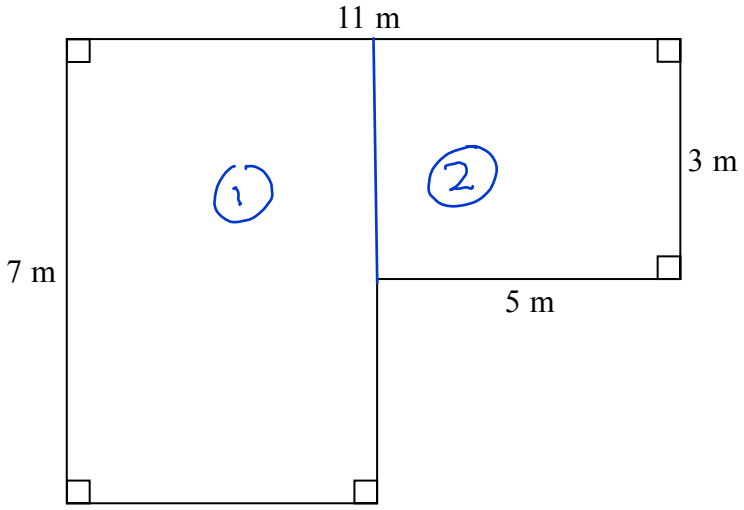


Diagram **NOT** accurately drawn

11 − 5 = 6 m

Kate is going to cover the floor with tiles.
She is going to buy some packs of tiles.

The tiles in each pack of tiles cover 2 m^2 of floor.
Each pack of tiles costs £24.80

Work out how much it will cost Kate to buy the packs of tiles she needs.

Area of floor: Area of (1) = 6 × 7 = 42 m^2 +
(2) = 5 × 3 = 15 m^2
Total = 57 m^2

Packs of tiles:
57 ÷ 2 = 28.5 — but needs to be a whole number so round up
29 packs

Cost: 29 × 24.80 =

£ 719.20

(Total for Question 12 is 5 marks)

13 A ship has a length of 345 metres.
A scale model is made of the ship.
The scale of the model is 1:200

Work out the length of the scale model of the ship.
Give your answer in centimetres.

Model : Real
1 : 200
$\times \frac{345}{200}$ $\times \frac{345}{200}$
1.725 : 345

1.725 m = 172.5 cm
×100

172.5 cm

(Total for Question 13 is 3 marks)

14 *A* has coordinates (3, 6)
B has coordinates (−5, 8)

Work out the coordinates of the midpoint of *AB*.

Midpoint $\left(\frac{3+-5}{2}, \frac{6+8}{2}\right)$

$= \left(\frac{-2}{2}, \frac{14}{2}\right)$

(−1 , 7)

(Total for Question 14 is 2 marks)

15 Here is a list of the ingredients needed to make leek and potato soup for 6 people.

Leek and Potato Soup	
Ingredients for 6 people	
900 ml	chicken stock
900 ml	water
750 g	leeks
350 g	potatoes
350 g	onions

Paul wants to make leek and potato soup for 15 people. scale factor $= \frac{15}{6} = 2.5$

(a) Work out the amount of chicken stock he needs.

900ml × scale factor

900 × 2.5 = 2250ml

2250 ml

(2)

Mary makes leek and potato soup for a group of people.
She uses 3 kg of leeks.

(b) Work out the number of people in the group.

3kg = 3000g (×1000)

Scale factor $= \frac{3000}{750} = 4$

6 × 4 = 24 people

(2)

(Total for Question 15 is 4 marks)

16 Find the lowest common multiple (LCM) of 20, 30 and 45

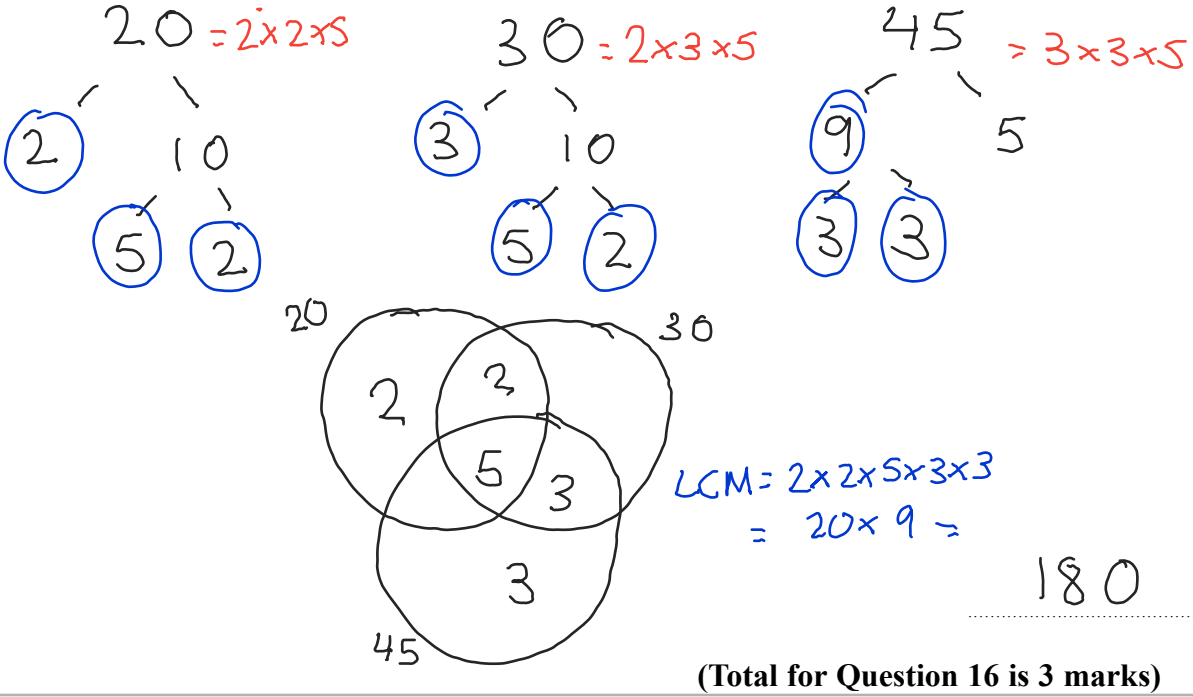
LCM :

20 : 20, 40, 60 ... 160, 180

30 : 30, 60, 90 ... 150, 180

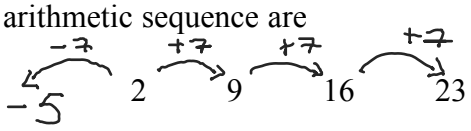
45 : 45, 90, 135, 180

OR



(Total for Question 16 is 3 marks)

17 The first four terms of an arithmetic sequence are



Write down an expression, in terms of n, for the nth term.

Di difference
n place n
0 Find 0th term

Di = 7

n : n

0^{th} : -5

$7n - 5$

(Total for Question 17 is 2 marks)

18

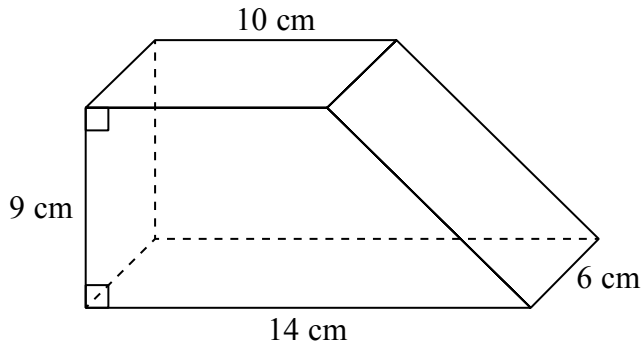


Diagram **NOT** accurately drawn

The diagram shows a solid prism.
The cross section of the prism is a trapezium.

The prism is made from wood with density 0.7 g/cm^3

Work out the mass of the prism.

Density = mass / volume

Volume: area of cross section × depth

= ½ (10 + 14) × 9 × 6

= 12 × 9 × 6 = 648 cm^3

Mass = Density × Vol

= 0.7 × 648

= 453.6 g

(Total for Question 18 is 4 marks)

19 (a) Simplify $p^5 \times p^4$

$= p^{5+4}$

p^9

(1)

(b) Simplify $(m^4)^{-3}$

$= m^{4 \times -3}$

m^{-12}

(1)

(c) Write down the value of c^0 ← 0 power rule

1

(1)

(d) Solve $5(x + 7) = 2x - 10$

Show clear algebraic working.

expand bracket

$5x + 35 = 2x - 10$

$-2x$

$3x + 35 = -10$

-35

$3x = -45$

$\div 3$

$x = -15$

$x =$ -15

(3)

(Total for Question 19 is 6 marks)

20 On 1 May 2012, the cost of 5 grams of gold was 14 000 rupees.
The cost of gold decreased by 7.5% from 1 May 2012 to 1 May 2013

Work out the cost of 20 grams of gold on 1 May 2013

Decrease by 7.5% = 100 − 7.5 = 92.5%
= ×0.925

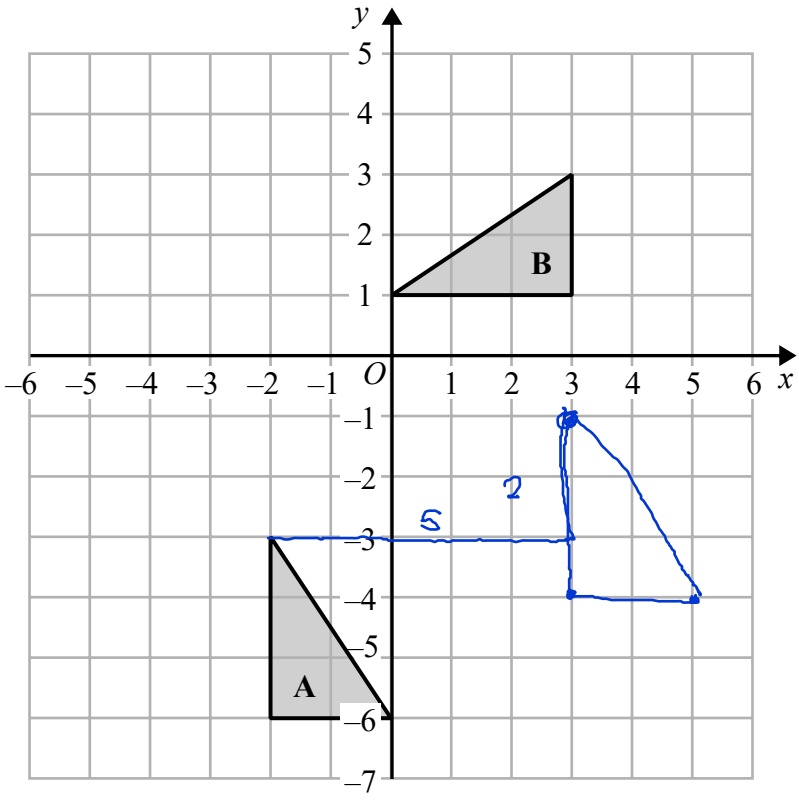
5g = 14000 (×4)
20g = 56000 rupee (×4)

In 2013, 20g = 56000 × 0.925
= 51,800

51800 rupees

(Total for Question 20 is 4 marks)

21



(a) On the grid, translate triangle **A** by the vector $\begin{pmatrix} 5 \\ 2 \end{pmatrix}$ 5 right 2 up **(1)**

(b) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

Rotation 90° anticlockwise centre (-3, 0)

same distance from (-3, 0) **(3)**

(Total for Question 21 is 4 marks)

22 a, b, c and d are 4 integers written in order of size, starting with the smallest integer.

(1) The mean of a, b, c and d is 15
(2) The sum of a, b and c is 39

(a) Find the value of d.

Mean = sum of all values / Total values

(1) $\frac{a+b+c+d}{4} = 15$ (2) $a+b+c=39$

sub in (2): $a+b+c+d = 60$

$39 + d = 60$

-39

$d =$ 21

(2)

Given also that the range of a, b, c and d is 10

(b) work out the median of a, b, c and d.

$d = 21$ Range = largest − smallest

$10 = d - a$

$a = d - 10 = 21 - 10 = 11$

11 , b , c , 21

median in between b and c — so $\frac{b+c}{2}$

(2) $a+b+c = 39$

$11+b+c = 39$

$b+c = 28$

median $= \frac{28}{2} = 14$

(2)

(Total for Question 22 is 4 marks)

23 Kwo invests HK$40 000 for 3 years at 2% per year compound interest.
Work out the value of the investment at the end of 3 years.

100% + 2% = 102% = x 1.02

Final value = 40,000 x 1.02^{3} ← years

Inital value

multiplier (Interest)

=

HK$ 42448.32

(Total for Question 23 is 3 marks)

24 Solve the simultaneous equations

$$\begin{aligned} &(1)\quad 3x + y = 13 \quad \times 2 \\ &(2)\quad x - 2y = 9 \end{aligned}$$

Show clear algebraic working.

(1) x 2 = $6x + 2y = 26$

(2) = $x - 2y = 9$ +

$7x = 35$

$\div 7$

$x = 5$

Using (1) $3(5) + y = 13$

3×5

$15 + y = 13$

-15

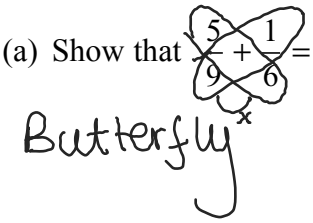
$y = -2$

$x =$ 5

$y =$ -2

(Total for Question 24 is 3 marks)

25 (a) Show that $\frac{5}{9} + \frac{1}{6} = \frac{13}{18}$



Butterfly

$= \frac{30+9}{54} = \frac{39}{54} = \frac{13}{18}$ (÷3 top, ÷3 bottom)

(2)

(b) Show that $4\frac{2}{3} \div 3\frac{5}{9} = 1\frac{5}{16}$

$4\frac{2}{3} = \frac{14}{3}$ $\quad 3\frac{5}{9} = \frac{32}{9}$ $\quad 1\frac{5}{16} = \frac{21}{16}$

$= \frac{14}{3} \div \frac{32}{9} = \frac{14}{3} \times \frac{9}{32} = \frac{126}{96}$ (÷6) $= \frac{21}{16}$

$= 1\frac{5}{16}$

(3)

(Total for Question 25 is 5 marks)

26

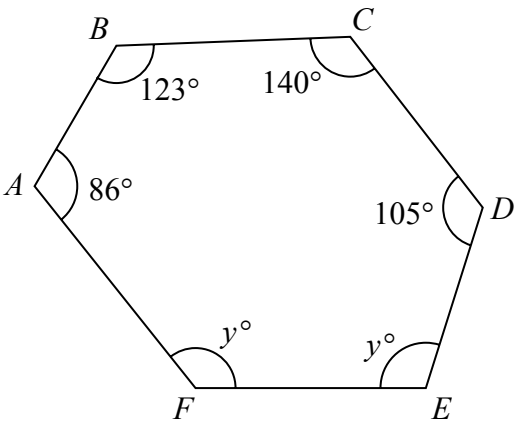


Diagram **NOT** accurately drawn

ABCDEF is a hexagon.

Work out the value of *y*.

sum of interial angle = 180(n-2)

n = number of sides

Hexagon: 180(6-2) = 720°

86 + 123 + 140 + 105 + y + y = 720

collect like terms

2y + 454 = 720

−456

2y = 266

÷2

y = 133

y = 133

(Total for Question 26 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS