1 On Monday, Sandy pays for 2 plane tickets, 7 nights in a hotel and 2 theme park tickets.

	dollars	
each plane ticket	600	× 2
each night in a hotel	120	× 7
each theme park ticket	250	× 2

Show that Sandy pays more than 2500 dollars on Monday.

Sandy pays: $(2 \times 600) + (7 \times 120) + (2 \times 250)$ (1)

$= 1200 + 840 + 500$ (1)

$= 2540$ (1) $\quad 2540 > 2500$

∴ Sandy pays more than 2500

according to BIDMAS, we need to multiply the terms first before adding them together

(Total for Question 1 is 3 marks)

2 Corina has £300 to spend on books.
Each book costs £4.85

Work out the greatest number of books Corina can buy.

Number of books Corina can buy :

$300 \div 4.85$ (1)

$= 61.86$ (1)

≈ 61 (greatest number of books Corina can buy)

(1)

since the question asks for the maximum number of books, we need to take only the integer

61

.....

(Total for Question 2 is 3 marks)

3 A stadium cost £600 million.

$\frac{13}{15}$ of this cost was for the building.

The rest of the cost was for the land.

Work out the cost of the land.

Total fraction = 1

cost of land : $1 - \frac{13}{15}$

$= \frac{15}{15} - \frac{13}{15}$

$= \frac{2}{15}$ (1)

$\frac{1 \times 15}{1 \times 15} = \frac{15}{15}$

multiply with the denominator

$\frac{2}{15_1} \times £600^{40}$ million (1)

= £80 million (1)

$15 \overline{)600}$ → 40, 60, 0, 0

£ 80 million

(Total for Question 3 is 3 marks)

4 Simon buys some candles.
Each candle costs £2

Simon pays with a £20 note.
He gets £6 change.

Work out the number of candles Simon buys.

Find out how much Simon paid:

£20 - £6 = £14 (1)

Each candle costs £2:

14 ÷ 2 = 7 (1)

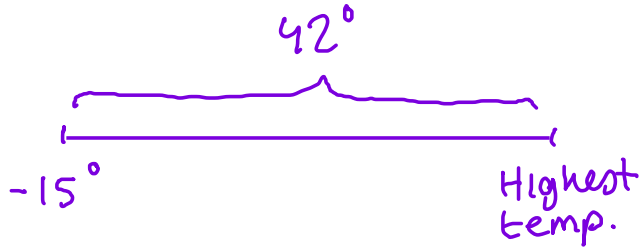
7 (1)

.....

(Total for Question 4 is 3 marks)

5 In Norway last year, the lowest temperature was −15°C.
In Norway last year, the highest temperature was 42°C greater than the lowest temperature.

Work out the highest temperature in Norway last year.



$-15 + 42 = 27$ (1)

(1)

27 °C

(Total for Question 5 is 2 marks)

---

6 At the end of October, Fiona's electricity meter reads 88 738 kWh.
At the end of November, her electricity meter reads 89 198 kWh.

Each kWh of electricity Fiona uses costs 16p

Work out how much Fiona had to pay for the electricity she used in November.

Find how much electricity Fiona used in November

$$\begin{array}{r} {}^{8}\not{9}\,{}^{1}9\,198 \\ -\ 88\,738 \\ \hline 00\,460 \end{array}$$

$89198 - 88738 = 460$ (1)

Fiona used 460 kWh in Nov.

Each kWh used costs £0.16p

$$\begin{array}{r} {}^{3}460 \\ \times\ 0.16 \\ \hline {}'2760 \\ 4600 \\ +\ 0000 \\ \hline 7360 \end{array}$$

$460 \times 0.16 = 73.60$ (2)

so the electricity cost £73.60

(1)

£73.60p

(Total for Question 6 is 4 marks)

7 Savio leaves his home at 07 30 to drive to work.

He drives a distance of 50 miles.

Savio thinks he drives at an average speed of 40 miles per hour.

(a) If Savio is correct, at what time will he arrive at work?

use time = $\frac{\text{distance}}{\text{speed}}$

time taken to drive to work = $\frac{50}{40}$ = 1.25 hours (1)

convert hours to minutes by multiplying by 60

$1.25 \times 60 = (1 + 0.25) \times 60 = 60 + 15 = 75$ minutes

$= 1$ h 15 minutes (1)

07:30 + 1h 15min

= 08:45

(1)

08:45

(3)

In fact, Savio's average speed was greater than 40 miles per hour.

(b) How does this affect your answer to part (a)?

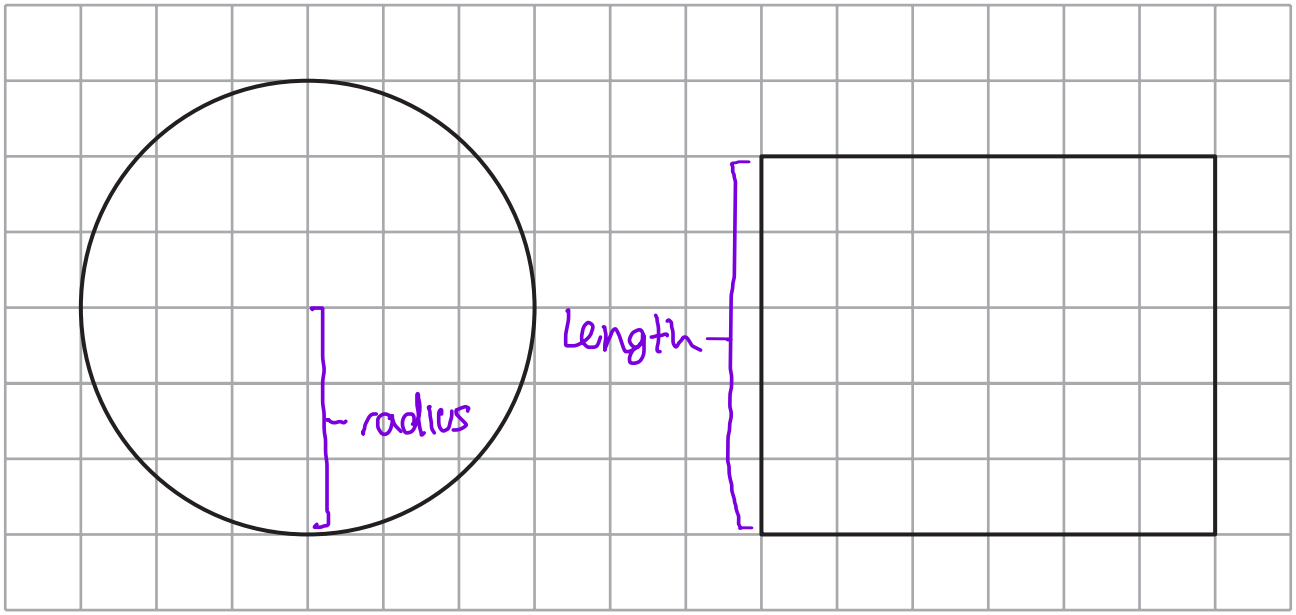
Savio drove faster → he got there earlier

The time will be earlier (1)

(1)

(Total for Question 7 is 4 marks)

8 The centimetre grid shows the plan and the front elevation of a cylinder.



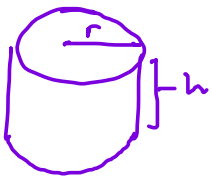
Plan Front elevation

Work out the volume of the cylinder.
Give your answer in terms of π

Find radius of the cylinder by counting squares

Radius = 3 squares = 3cm

∴ Area of crossection is $\pi r^2 = \pi(3)^2 = 9\pi$ (1)



Find length of cylinder

Length = 5 squares = 5cm

Area of cylinder = area of crossection x length

∴ area is $9\pi \times 5 = 45\pi$ (1)

(1)

45π ..... cm^3

(Total for Question 8 is 3 marks)

9 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.
25% of the cars use diesel.
The rest of the cars use petrol.

Work out the number of cars that use petrol.
You must show all your working.

cars : vans
3 : 7
×16 ↓ ×16
48 : _

3 + 7 = 10
160 ÷ 10 = 16 (1)

1
16
3
48 (1)

So there are 48 cars.

Number of cars using electricity:

$\frac{1}{8} \times 48 = \frac{48}{8} = 6$ (1)

Number of cars using diesel:

25% of 48 = $\frac{1}{4} \times 48 = 12$ (1)

Number of cars using petrol

= 48 − 6 − 12 = 30 (1)

↑ from electricity
↖ from diesel

30

(Total for Question 9 is 5 marks)

10 Sonia wants to book a holiday.
The holiday will cost £1428

Sonia will pay a deposit of £150
She will then pay the rest of the cost in 6 equal monthly payments.

How much is each monthly payment?

Find cost minus deposit:

£1428 - £150 = £1278 (1)

She pays £1278 in 6 monthly deposits.

Each deposit is worth $\frac{£1278}{6}$ (1) = £213

£ 213 (1)

(Total for Question 10 is 3 marks)

11 This sign was in a doctor's waiting room.

> 115 appointments were missed last month.
>
> These missed appointments were a total of 25.3 hours.

Work out the mean length of time for each missed appointment.
Give your answer in minutes.

Convert 25.3 hours to minutes by $\times 60$ (1)

$25.3 \times 60 = 1518$ minutes

$\therefore$ the sum of all missed appointments was 1518 minutes

for mean length:

$\frac{1518}{115} = 13.2$ (1)

(1)

13.2 ..... minutes

(Total for Question 11 is 3 marks)

12 Nimra buys a 3 kg box of sweets for £17.60

She puts the sweets into bags to sell.
Each bag contains 150 g of sweets.

Nimra fills as many bags as possible.
She will sell each bag for the same price.

Nimra wants to make a profit of at least 35%

Assuming she sells all the bags,
what is the lowest price Nimra should charge for each bag?

Find the maximum number of 150g bags she can fill with 3kg of sweets:

$3\text{kg} = 3000\text{g}$ $\quad \frac{3000\text{g}}{150\text{g}} = 20$ bags

She can sell 20 bags. (1)

Find how much money would give her a profit of 35%

35% of £17.60 $= \frac{35}{100} \times 17.6 = 6.16$ (1)

so she must make £17.60 + £6.16 = £23.76 (1)
from selling the 20 bags.

∴ each bag must sell for at least

$\frac{£23.76}{20}$ (1) $= £1.19$

£ 1.19 (1)

(Total for Question 12 is 5 marks)

13 Festival A will be in a rectangular field with an area of 80 000 m^2
The greatest number of people allowed to attend Festival A is 425

Festival B will be in a rectangular field 700 m by 2000 m.
The greatest number of people allowed to attend Festival B is 6750

The area per person allowed for Festival B is greater than the area per person allowed for Festival A.

(a) How much greater?
Give your answer correct to the nearest whole number.

Festival A
area = 80,000 m^2
max. people = 425
area per person
= $\frac{80,000}{425}$ (1)
= 188 (nearest whole number)

Festival B (1)
area = 700m x 2000m = 1,400,000 m^2
max. people = 6750
area per person
= $\frac{1,400,000}{6750}$ (1)
= 207 (nearest whole number)

Difference between area per person
= 207 - 188 = 19 (1)

19 ..... m^2
(4)

Callum says,

"300 cm^2 is the same as 3 m^2 because there are 100 cm in 1 m so you divide by 100"

Callum's method is wrong.

(b) Explain why.

There are 10,000cm^2 in 1 m^2 (1)

$1m^2 = 1m \times 1m = 100cm \times 100cm = 10,000\,cm^2$

(1)

(Total for Question 13 is 5 marks)

14 The table shows the total number of apples sold and the total number of oranges sold in a shop in each of three weeks.

	Week 1	**Week 2**	**Week 3**
Number of apples	86	75	92
Number of oranges	68	80	76

In total for the three weeks, more apples than oranges were sold.
How many more?

Apple sales : 86 + 75 + 92 = 253

Orange sales : 68 + 80 + 76 = 224 (1)

Difference between apples and oranges sold :

253 - 224 = 29 (1)

29 (1)

(Total for Question 14 is 3 marks)

15 Sinita wants to make 35 picture frames.
She needs 4 nails for each frame.

Sinita has 3 boxes of nails.
There are 48 nails in each box.

Has Sinita got enough nails to make all 35 frames?
Show how you get your answer.

Nails needed for all 35 frames :

$35 \times 4 = 140$ (1)

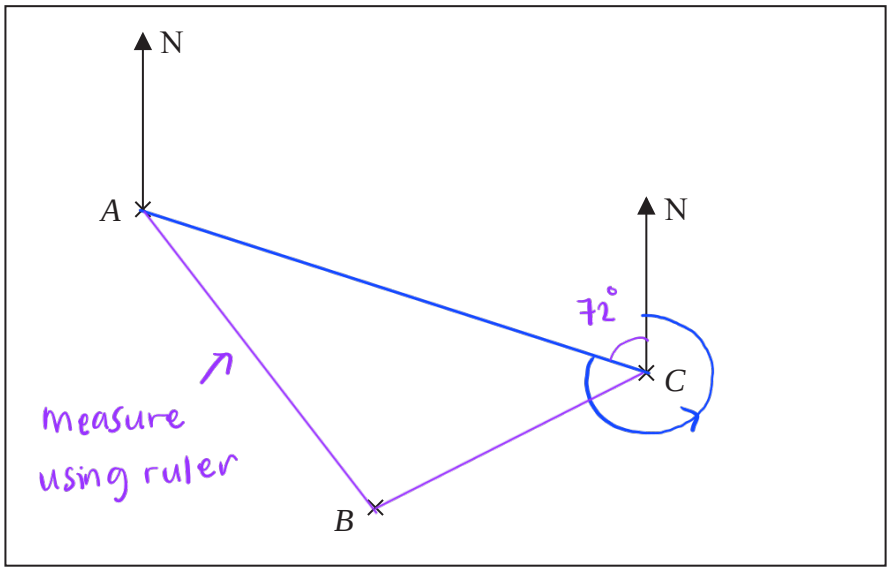
Nails that Sinita has :

$48 \times 3 = 144$ (1)

Yes, Sinita has enough nails since $144 > 140$ (1)

(Total for Question 15 is 3 marks)

16 The accurately drawn map shows the positions of three points, *A*, *B* and *C*, in a field.



Scale: 1 cm represents 150 metres

Parveen walks in a straight line from *A* to *B*.
She then walks in a straight line from *B* to *C*.

Susan walks in a straight line from *A* to *C*.

Parveen walks more metres than Susan.

(a) How many more?

1 cm = 150 m

measure by ruler

A to B : 5 cm x 150 = 750 m

B to C : 4 cm x 150 = 600 m

A to C : 7 cm x 150 = 1050 m (1)

Parveen walks 750 m + 600 m = 1350 m

Susan walks 1050 m

Difference : 1350 m - 1050 m : 300 m (1)

(1)

300 metres

(3)

(b) Find by measurement the bearing of *A* from *C*.

angle for whole circle → 360° - 72°

= 288° (1)

288 °

(1)

(Total for Question 16 is 4 marks)

17 There are 400 counters in a box.
The counters are red or yellow or green.

$\frac{3}{8}$ of the counters are red.

82 of the counters are yellow.

What percentage of the counters are green?

Number of red counters

$\frac{3}{8} \times 400 = 150$ (1)

↘ total counters

Number of green counters

Total - red - yellow

$= 400 - 150 - 82$

$= 168$ (1)

Percentage of green counters

$\frac{168}{400} \times 100\%$ (1) $\frac{\text{Green counters}}{\text{Total counters}} \times 100$

$= 42\%$ (1)

42 ..... %

(Total for Question 17 is 4 marks)

18 Rick, Selma and Tony are playing a game with counters.

Rick has some counters. n
Selma has twice as many counters as Rick. 2n
Tony has 6 counters less than Selma. 2n - 6

In total they have 54 counters.

the number of counters Rick has : the number of counters Tony has = 1 : *p*

Work out the value of *p*.

Counters : Rick = n
Selma = 2n
Tony = 2n - 6 (1)

Finding value of n :

n + 2n + 2n - 6 = 54 counters (1)
5n - 6 = 54
5n = 54 + 6
5n = 60
n = 12 counters (1)

∴ Rick has 12 counters
∴ Selma has 24 counters
∴ Tony has 18 counters

Number of counter Rick has : Number of counter Tony has = 1 : p

12 : 18 = 1 : p (1)

$\frac{18}{12} = p$

p = 1.5 (1)

p = 1.5

(Total for Question 18 is 5 marks)

19 Jessica runs for 15 minutes at an average speed of 6 miles per hour.
She then runs for 40 minutes at an average speed of 9 miles per hour.

It takes Amy 45 minutes to run the same total distance that Jessica runs.

Work out Amy's average speed.
Give your answer in miles per hour.

$\text{speed} = \frac{\text{distance}}{\text{time}}$

$\text{distance} = \text{speed} \times \text{time}$

1 hour = 60 minutes

Jessica :

First run : $6 \text{ miles/h} \times \frac{15}{60} \text{ h} = 1.5 \text{ miles}$

Second run : $9 \text{ miles/h} \times \frac{40}{60} \text{ h} = 6 \text{ miles}$ (1)

Total distance = $1.5 + 6 = 7.5$ miles (1)

Amy

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$= \frac{7.5 \text{ miles}}{\frac{45}{60} \text{ h}}$$ (1)

$$= 10 \text{ miles/h}$$ (1)

10 miles per hour

(Total for Question 19 is 4 marks)

20 The value of Michelle's car has decreased by 15%
The car now has a value of £13 600

Work out the value of Michelle's car before the decrease.

100% = x

85 % = £ 13 600

$\frac{100}{85} = \frac{x}{13\,600}$

$x = \frac{100}{85} \times 13\,600$ (1)

= 160 00 (1)

£ 16 000

(Total for Question 20 is 2 marks)

21 The number of hours, H, that some machines take to make 5000 bottles is given by

$$H = \frac{72}{n}$$ where n is the number of machines.

On Monday, 6 machines made 5000 bottles.
On Tuesday, 9 machines made 5000 bottles.

The machines took more time to make the bottles on Monday than on Tuesday.

How much more time?

Monday : $H = \frac{72}{6} = 12$ hours (1)

Tuesday : $H = \frac{72}{9} = 8$ hours

12 hours − 8 hours = 4 hours (1)

4 hours

(Total for Question 21 is 2 marks)

22 Lucia is going on a skiing holiday.

The cost of ski hire is £26 per day.
The cost of a lift pass is £45 per day.
The cost of ski lessons is £23.50 per hour.

Lucia will pay for
ski hire for 5 days
a lift pass for 4 days
ski lessons for 8 hours.

Lucia has £500

Show that Lucia has enough money to pay for the total cost of ski hire, the lift pass and the ski lessons.

ski hire = £26 / day
lift pass = £45 / day
ski lessons = £23.50 / hour

what Lucia need = ski hire for 5 days : £26 x 5 = £130
lift pass for 4 days : £45 x 4 = £180
ski lessons for 8 hours : £23.50 x 8 = £188 (1)

Total cost : £130 + £180 + £188
= £498 (1)

£498 is less than £500. Lucia has enough money to pay for the total cost. (1)

(Total for Question 22 is 3 marks)