

1

A college has

a total of 105 teachers

19 more female teachers than male teachers.

What proportion of the teachers are female?

[3 marks] $\text{let } x = \text{male teachers}$ $x + 19 = \text{female teachers}$

$$x + x + 19 = 105 \quad (1)$$

$$x = 43$$

$$\text{female} = 43 + 19 = 62 \quad (1)$$

Answer

$$\frac{62}{105} \quad (1)$$

2

Saj makes Rose Pink paint and Cherry Pink paint.

He mixes red paint with white paint as shown.

Rose Pink

red : white = 1 : 2

Cherry Pink

red : white = 4 : 3

He makes 60 litres of Rose Pink paint.

To this Rose Pink paint he adds

80 litres of red paint and 28 litres of white paint.

Has he now made Cherry Pink paint?

You **must** show your working.

[4 marks]

$$60 \div 3 = 20 \text{ litres} \quad (1)$$

Initially : rose pink = 20 litre red + 40 litre white

After added : 20 + 80 red , 40 + 28 white

= 100 red , 68 white

(1) (1)

$$\text{red : white} = \frac{100}{4} : \frac{28}{4} = 25 : 7$$

No. He does not make Cherry Pink paint.

(1)

3 (a) Tom is tiling a wall.

He needs to buy at least 100 tiles.

The tiles are sold in large packs and small packs.

Large pack 40 tiles £18

Small pack 28 tiles £14

Special offer

25% reduction when you buy 3 or more **large** packs

Work out the cheapest cost for Tom to buy the packs of tiles he needs.

[3 marks]

[option 1] 3 large pack : $3 \times £18 = £54 \times 0.75 = £40.5$

[option 2] : 2 large pack, 1 small pack : $£18 + 18 + 14 = £50$

[option 3] : 4 small packs = $4 \times £14 = £56$

Answer £ 40.50

3 (b) Tom is also tiling a floor.

The floor is a rectangle with length 600 cm and width 240 cm

Each tile is a square with side 40 cm

Tom uses this method to work out the number of tiles he needs.

$$\begin{aligned}\text{Number of tiles that will fit along the length} &= 600 \div 40 \\ &= 15\end{aligned}$$

$$\begin{aligned}\text{Number of tiles that will fit along the width} &= 240 \div 40 \\ &= 6\end{aligned}$$

$$\begin{aligned}\text{Total number of tiles needed} &= 15 + 6 \\ &= 21\end{aligned}$$

Give a reason why Tom's method is wrong.

[1 mark]

Should have multiplied 15 with 6 , not added.

①

4

Working alone, it takes Kevin 4 hours to paint an area of 12 m^2

Kevin and Steve are going to paint an area of 24 m^2

Kevin says,

“Working together at the same rate it will take us 8 hours, because 24 is 2×12 ”

Is he correct?

Tick a box.

☐

Yes

☒

No

Give a reason for your answer.



[1 mark]

No as it will be quicker than 8 hours.

5

6 cakes cost £10.74

Work out the cost of 11 of these cakes.

[2 marks]

$$\frac{11}{6} \times \textcircled{1} 10.74 = 19.69 \textcircled{1}$$

Answer £ 19.69

6

	Cost of 100 grams
Cereal	49p
Pasta	14p

Leah buys 400 grams of cereal and 250 grams of pasta.

Work out the **total** cost in £

[4 marks]

$$\text{cereals : } 49\text{p} \times \frac{400}{100} = 196\text{p}$$

(1)

(1)

$$\text{pasta : } 14\text{p} \times \frac{250}{100} = 35\text{p}$$

$$\text{Total : } 196\text{p} + 35\text{p} = 231\text{p} \quad (1)$$

$$= \text{£ } 2.31$$

(1)

Answer £ 2.31

7 A machine to clean carpets can be hired.

Machine hire

£25 per day

Cleaning fluid

1-litre bottle £10

2-litre bottle £18

Rana wants to

hire the machine for 1 day

and

buy 5 litres of cleaning fluid.

$$5 \times 1 \text{ litre} = £50$$

$$1 \times 2\text{l} + 3 \times 1\text{l} = 18 + 3 \times 10$$

$$= 18 + 30$$

$$= 48$$

Work out the **smallest** total amount she could pay.

[3 marks]

$$\text{Machine hire} = £25$$

$$\text{Cleaning fluid} = 2 \times £18 + 1 \times £10$$

$$= £36 + £10$$

$$= £46 \quad (1)$$

$$\text{Total} = 25 + 46 \quad (1)$$

$$= 71 \quad (1)$$

Answer £ 71

8

Steve and Molly each buy 480 tea bags.

Small packs

80 tea bags for £1.90

Large packs

160 tea bags for £3.25

Steve buys only small packs.

Molly buys only large packs.

In total, how much **more** than Molly does Steve pay?**[4 marks]**

$$\text{Steve: } \frac{480}{80} = 6 \quad (1)$$

$$6 \times £1.90 = £11.40$$

(1)

$$\text{Molly: } \frac{480}{160} = 3$$

$$3 \times £3.25 = £9.75$$

(1)

$$£11.40 - £9.75 = £1.65$$

(1)

Answer £ 1.65

9

Sam types a constant number of words per minute.

He takes 8 minutes to type a report of 416 words.

How long does it take him to type an essay of 1534 words?

Give your answer in minutes and seconds.

[3 marks]

$$\frac{416}{8} = 52 \text{ words per minutes} \quad (1)$$

$$\frac{1534}{52} = 29.5 \text{ minutes} \quad (1)$$

$$= 29 \text{ mins } 30 \text{ seconds}$$

(1)

Answer 29 minutes 30 seconds

- 10 (a) A shop sells bottles of orange juice.

Each bottle costs 75p

Work out the greatest number of bottles that can be bought with £5

[2 marks]

$$£5 = 500 \text{ p}$$

$$500 \text{ p} \div 75 \text{ p} = 6.677$$

$$\textcircled{1} = 6 \text{ bottles}$$

Answer

6 $\textcircled{1}$

- 10 (b) Two shops sell bottles of apple juice.

Shop X

pack of 4 bottles

Was £2.50

Now 10% off

Shop Z

pack of 12 bottles

£7

At which shop is it cheaper to buy 24 bottles?

Show working to support your answer.

[4 marks]

$$X : \frac{24}{4} = 6 \times 2.50$$

$$= 15$$

$$\textcircled{1} 0.9 \times 15 = 13.50 \textcircled{1}$$

$$Z : \frac{24}{12} = 2 \times 7 = 14 \textcircled{1}$$

Answer

X $\textcircled{1}$

11

Popcorn is sold in bags.

8 small bags have a total mass of 496 g

5 small bags and 2 large bags have a total mass of 638 g

Work out the mass of a large bag.

[4 marks]

$$\text{small : } \frac{496 \text{ g}}{8} = 62 \text{ g each}$$

$$\text{let large bag} = x$$

$$5(62) + 2x = 638$$

$$310 + 2x = 638$$

$$2x = 638 - 310$$

$$2x = 328$$

$$x = \frac{328}{2} = 164 \text{ g}$$

Answer 164 g

- 12 A shop sells notebooks and pencils.

Notebooks
Pack of 8 for £12

Pencils
56p each
or
Pack of 6 for £2.70

- 12 (a) Marek buys some **packs** of notebooks.
The cost is £60

In total, how many **notebooks** does he buy?

[2 marks]

$$\frac{60}{12} = 5 \text{ packs} \quad (1)$$

$$5 \times 8 = 40 \text{ notebooks} \quad (1)$$

Answer 40

- 12 (b) Work out the cheapest cost of 10 pencils.

[3 marks]

$$\text{option 1: } 10 \times 0.56 = \text{£ } 5.60 \quad (1)$$

$$\text{option 2: } 4 \times 0.56 + \text{£ } 2.70 = \text{£ } 4.94$$

$$\text{option 3: } 2 \times 2.70 = \text{£ } 5.40$$

Answer £ £4.94 (1)

- 12 (c) The shop also sells folders for £3.20 each.
The shop has this offer.



Work out the cost of 4 folders using the offer.

[3 marks]

$$\begin{aligned} & 3 \times 3.20 + \frac{1}{2} \times 3.20 \\ & = 9.60 + 1.60 \\ & = 11.20 \end{aligned}$$

Answer £ 11.20

- 13 Bag A and bag B each contain only red discs and green discs.

Bag A	Contains 28 red discs There are twice as many red discs as green discs
Bag B	Contains 20 green discs There are 3 red discs for every 5 green discs

- 13 (a) Work out the **total** number of discs.

[3 marks]

$$\text{Bag A : Red} = 28$$

$$\text{Green} = \frac{28}{2} = 14 \quad (1)$$

$$\text{Bag B : Red} = \frac{20}{5} \times 3 = 12 \quad (1)$$

$$\text{Green} = 20$$

$$\text{Total : } 28 + 14 + 12 + 20 = 74 \quad (1)$$

Answer 74

14 (a) Jamil rides a motorbike.

The motorbike uses one litre of petrol for every 14 miles.

How many litres of petrol does the motorbike use to go 168 kilometres?

Use 8 kilometres = 5 miles

$$\frac{168 \text{ km}}{8 \text{ km}} \times 5 \text{ miles} = 105 \text{ miles}$$

[3 marks]

$$\frac{105 \text{ miles}}{14 \text{ miles}} = 7.5 \text{ (3)}$$

Answer 7.5 litres

- 15 Two bags, X and Y, each contain coloured discs.

In bag X, $\frac{7}{20}$ of the discs are red.

In bag Y, $\frac{2}{5}$ of the discs are red.

Which bag has the **greater** proportion of red discs, X or Y?

You **must** show your working.

[2 marks]

Bag X = $\frac{7}{20}$ are red discs.

Bag Y = $\frac{2 \times 4}{5 \times 4} = \frac{8}{20}$ are red discs. ✓①

Bag Y has greater proportion of red discs.

Answer Bag Y ✓①

- 16** There are 56 cubes in a box.
The cubes are green, red, blue or white.
17 cubes are green.
There are an **equal** number of red, blue and white cubes.

- 16 (a)** How many red cubes are in the box?

[2 marks]

$$\text{red} + \text{blue} + \text{white} = 56 - 17 = 39 \quad \checkmark \textcircled{1}$$

$$\text{red cubes} = 39 \div 3 = 13$$

Answer 13 $\checkmark \textcircled{0}$

- 17** Rick claims most of the flats in his 8-floor building are energy efficient.
He samples 45 flats from floors 1 to 5
- Give a reason why this sample may **not** be useful in testing Rick's claim. **[1 mark]**

The data only consists 5 out of 8 floors

/ (1)