Non-Calc

2 Work out 10% of 250.

250 ÷ 10 = 25

25 [1]

2 Work out 15% of 600. NC

10% : 60

5% : 30

15% = 60+30
= 90

90 [2]

4 Find 2% of $400. NC

1% : 4

2% = 2×4
= 8

$ 8 [1]

6 Each week Nisha is paid $12 per hour for the first 40 hours that she works. Calculator
She is paid 30% more per hour for any extra hours that she works.
One week Nisha works for 45.5 hours.

Calculate how much she is paid that week.

First 40 hours:

40 × 12 = 480

Extra 5.5 hours:

hourly rate: 12 × 1.3 = 15.6 per hour

5.5 × 15.6 = 85.8

480 + 85.8

$ 565.80 [3]

100% + 16% = 116%

Calc

5 Increase 42 by 16%.

$42 \times 1.16 = 48.72$

48.72 ..... [2]

NC

6 The price of a computer is $520.
This price is reduced by 15% in a sale.

Work out the sale price.

10% : 52

5% : 26

15% : 52 + 26
= 78

$$\begin{array}{r} {}^{4}5{}^{1}{}^{1}{}^{1}20 \\ -\ 78 \\ \hline 442 \end{array}$$

$ 442 ..... [2]

Calc

7 The price of a coat is $126.
In a sale, this price is reduced by 18%. ← 100% − 18% = 82%

Find the sale price of the coat.

$126 \times 0.82 = 103.32$

$ 103.32 ..... [2]

NC

6 Marek buys a computer for $420.
He sells it at a loss of 15%.

Calculate the selling price of this computer.

10% : 42

5% : 21

15% : 42 + 21
= 63

$$\begin{array}{r} {}^{3}4{}^{1}{}^{1}{}^{1}20 \\ -\ 63 \\ \hline 357 \end{array}$$

$ 357 ..... [2]

NC

3 Write 32 cm as a fraction of 2 m. ← 200cm
Give your answer in its simplest form.

$\frac{32}{200} = \frac{4}{25}$

$\frac{4}{25}$ [2]

Calc

1 Write 26 g as a percentage of 208 g.

$\frac{26}{208} \times 100 = 12.5\%$

12.5 % [1]

Calc

(b) In 2021, Anil earns $37 000.

(i) He spends $12 400 on bills in 2021.

Calculate the percentage of his earnings he spends on bills.

$\frac{12400}{37000} \times 100 = 33.51..\%$

33.5 % [2]

Calc

(ii) His earnings of $37 000 increase by 3.2% in 2022.

↳ 100% + 3.2% = 103.2%

Calculate his earnings in 2022.

$37000 \times 1.032 = 38184$

$ 38 184 [2]

NC

(ii) In a sale, all prices are reduced by 15%.

(a) Yasmin buys a blouse with an original price of $40.

Calculate the sale price of the blouse.

10% : 4

5% : 2

15% = 4 + 2
= 6

40 − 6 = 34

$ 34 [2]

9 **(a)** Ahmed increases 40 by 300%. → 100% + 300% = 400%

NC

From this list, put a ring around the correct calculation.

400% of 40
= 4 × 40

40 × 1.300 | 40 × 3 | 40 × 400 | 40 × 4 | 40 × 300

[1]

8 Hadi buys a dishwasher.
He can either pay a single payment of $980 or he can pay using a monthly plan.
The monthly plan is 20% of $980 **plus** 12 payments of $75.25 .

Calc

(a) Hadi uses the monthly plan.

Calculate the total amount Hadi pays.

10% : 98

20% = 2 × 98
= 196

196 + 12 × 75·25
= 196 + 903
= 1099

$ 1099 [2]

(b) Find the percentage increase in the cost using the monthly plan compared to a single payment.

% increase = $\frac{\text{increase}}{\text{original amount}} \times 100$

increase = 1099 − 980
= 119

% increase = $\frac{119}{980} \times 100$
= 12·1%

12·1 % [2]

Calc

12 Roberto buys a toy for \$5.00 .
He then sells it for \$4.60 .

Calculate his percentage loss.

$\%\ \text{loss} = \dfrac{\text{loss}}{\text{original amount}} \times 100$

$\text{loss} = 5 - 4{\cdot}6$
$= 0{\cdot}4$

$\%\ \text{loss} = \dfrac{0{\cdot}4}{5} \times 100$
$= 8\%$

8 ..... % [2]

NC

(c) In May, the company had sales of \$6 million.
In June, the company had sales of \$7.5 million.

Find the percentage increase in sales from May to June.

$\%\ \text{increase} = \dfrac{\text{increase}}{\text{original amount}} \times 100$

$\text{increase} = 7{\cdot}5 - 6$
$= 1{\cdot}5$ (million)

$\%\ \text{increase} = \dfrac{1{\cdot}5}{6} \times 100$
$= \frac{1}{4} \times 100$
$= 0{\cdot}25 \times 100$

25 ..... % [3]

Calc

(ii) For an afternoon flight, the cost of a Premium ticket is reduced from \$114 to \$96.90 .

Calculate the percentage reduction in the cost of a ticket.

$\%\ \text{reduction} = \dfrac{\text{reduction}}{\text{original amount}} \times 100$

$\text{reduction} = 114 - 96{\cdot}9$
$= 17{\cdot}1$

$\%\ \text{reduction} = \dfrac{17{\cdot}1}{114} \times 100$
$= 15\%$

15 ..... % [2]

Calc

1 (a) In 2018, Gretal earned $32 000.

(i) She paid tax of 24% on these earnings.

Work out the amount she paid in tax in 2018.

$0{\cdot}24 \times 32000 = 7680$

$ 7 680 [2]

(ii) In 2019, Gretal's earnings increased by 7%. → 100% + 7% = 107%.

Work out her earnings in 2019.

$32000 \times 1{\cdot}07 = 34240$

$ 34 240 [2]

Calc

(ii) Write $24.60 as a fraction of $2870.
Give your answer in its lowest terms.

$$\frac{24{\cdot}6}{2870} = \frac{3}{350}$$

$\frac{3}{350}$ [2]

(iii) Write $1.92 as a percentage of $1.60 .

$$\frac{1{\cdot}92}{1{\cdot}6} \times 100 = 120\%$$

120 % [1]

(b) In a sale the original prices are reduced by 15%. ← 100% − 15% = 85% NC

(i) Calculate the sale price of a book that has an original price of $12.

$12 \times 0{\cdot}85 = 10{\cdot}2$

$ 10.20 [2]

Calc

6 Joseph spends $\frac{5}{24}$ of one week's earnings to buy a jacket.
The cost of the jacket is \$56.50 .

Calculate the amount Joseph earns in a week.

$\frac{5}{24} = 56.5$

÷5 ↓ $\frac{1}{24} = 11.3$ ↓ ÷5

$\frac{24}{24} = 11.3 \times 24$

$= 271.2$

\$ 271.20 [2]

Calc

6 At the end of the day, a shopkeeper has 12 tins of cat food left.
This is $\frac{3}{13}$ of the number he had at the beginning of the day.

Calculate the number of tins he had at the beginning of the day.

$\frac{3}{13} = 12$ tins

÷3 ↓ $\frac{1}{13} = 4$ tins ↓ ÷3

×13 ↓ $\frac{13}{13} = 52$ tins ↓ ×13

52 tins [2]

(b) Lucy spends $\frac{3}{8}$ of the money she has saved this month on a book that costs \$5.25 .

Calc

Calculate how much money Lucy has saved this month.

$\frac{3}{8} = 5.25$

÷3 ↓ $\frac{1}{8} = 1.75$ ↓ ÷3

×8 ↓ $\frac{8}{8} = 14$ ↓ ×8

\$ 14 [2]

Calc

(ii) In 2021, the value of the team's players was \$2.65 million.
In 2022 this value has decreased by 12%. ← 100% − 12% = 88%

Find the value in 2022.

$2.65 \times 0.88 = 2.332$

\$ 2.332 million [2]

Calc

(iii) The number of people at a football match is 1455.
This is 6.25% of the total number of people allowed in the stadium.

Find the total number of people allowed in the stadium.

6.25% = 1455 people

÷6.25 ↓

1% = 232.8

×100 ↓

100% = 23 280

23 280 [2]

(b) In a sale, a shop reduces all prices by 12%. ← 100% − 12% = 88% Calc

(i) Dina buys a book which has an original price of $6.50.

Calculate how much Dina pays for the book.

$6.5 \times 0.88 = 5.72$

$ 5.72 [2]

(d) At the start of 2021 the value of a car was $46 500.
At the end of 2021 the value of the car was 20% less. ← 100% − 20% = 80% Calc
At the end of 2022 the value of the car was 15% less than its value at the end of 2021. ← 100% − 15% = 85%

Calculate the value of the car at the end of 2022.

end of 2021: $46\,500 \times 0.8 = 37\,200$

end of 2022: $37\,200 \times 0.85 = 31\,620$

$ 31 620 [2]

1 (a) The table shows the areas, in km^2, of the four largest rainforests in the world. Calc

Rainforest	Area (km^2)
Amazon	5 500 000
Congo	2 000 000
Atlantic	1 315 000
Valdivian	250 000

(i) Find the area of the Valdivian rainforest as a percentage of the area of the Amazon rainforest.

$\frac{250\,000}{5\,500\,000} \times 100 = 4.5454...$

4.55 % [1]

(iii) The Amazon rainforest has 60% of its area in Brazil and 10% of its area in Colombia. Calc
$43\frac{1}{3}$% of the **remaining area** of the rainforest is in Peru.

Find the percentage of the Amazon rainforest that is in Brazil, Colombia and Peru.

Remaining area: $100\% - 60\% - 10\% = 30\%$

$43\frac{1}{3}$% of 30%: $0.4333... \times 30 = 13\%$

Brazil + Colombia + Peru: $60\% + 10\% + 13\% = 83\%$

83 % [3]

Calc

(c) In January 2020, the population of a town was 5% **more** than its population in January 2018.
In January 2021, the population of this town was 2% **less** than its population in January 2020.

Calculate the overall percentage increase in the population from January 2018 to January 2021.

5% more: $100\% + 5\% = 105\%$

2% less: $100\% - 2\% = 98\%$

Population in 2021: $P \times 1.05 \times 0.98$

$= P \times 1.029$

→ 1.029 is 100% + 2.9% ..... 2.9 ..... % [2]

18 F is proportional to the product of m and a.

100% + 40% = 140%

Calc

Calculate the percentage change in F when m is increased by 40% and a is decreased by 15%.

→ 100% − 15% = 85%

$F = m \times a$

$m \to 1.4m$ and $a \to 0.85a$:

$F = 1.4m \times 0.85a$

$= 1.4 \times 0.85ma$

$= 1.19ma$

..... 19 ..... % [3]

→ 1.19 is 100% + 19%