EXAM PAPERS PRACTICE

GCSE Edexcel Math
1MA1
Reverse Percentages

Answers

"We will help you to achieve A Star "

Answer 1

The normal price of a television is reduced by 30% in a sale.

The sale price of the television is £350

Work out the normal price of the television.

70% LEFT.

SALE PRICE IS 70% OF NORMAL PRICE

$SP = \frac{70}{100} \times NP$

$100 \times 350 = \frac{70}{100} \times NP \times 100$ (GROF)

$\frac{100 \times 350}{70} = \frac{70 \times NP}{70}$

$NP = \frac{100 \times 350^{5}}{70_{1}}$

$= 100 \times 5$

$NP = £500$

PERCENTAGES

WRITE DOWN A STATEMENT CONNECTING THE 'BEFORE' AND 'AFTER'

Answer 2

Each year Wenford Hospital records how long patients wait to be treated in the Accident and Emergency department.

In 2015 patients waited 11% less time than in 2014
In 2015 the average time patients waited was 68 minutes.

(a) Work out the average time patients waited in 2014
Give your answer to the nearest minute.

MULTIPLY BY 0·89

WAIT$_{15}$ IS 89% OF WAIT$_{14}$

$W_{15} = 0.89 \times W_{14}$

$\frac{68}{0.89} = \frac{0.89 \times W_{14}}{0.89} \rightarrow W_{14} = \frac{68}{0.89} = 76$

76 minutes

PERCENTAGES

WRITE DOWN A STATEMENT CONNECTING THE 'BEFORE' AND 'AFTER'

FOR PART (a)

PERCENTAGE DECREASES (THE BEST WAY!)

TO DECREASE BY, SAY, 3%.

THINK: WE WANT 97%. SO WE MULTIPLY BY $\frac{97}{100}$ (=0·97)

Answer 3

Jules buys a washing machine.

20% VAT is added to the price of the washing machine.
Jules then has to pay a total of £600

What is the price of the washing machine with **no** VAT added?

PERCENTAGE INCREASES (THE BEST WAY!)
TO INCREASE BY, SAY, 3% 20%
THINK: WE WANT 103% 120% SO WE
MULTIPLY BY $\frac{103}{100}$ (=1.03) $\frac{120}{100}$ = 1.2

PERCENTAGES
WRITE DOWN A STATEMENT CONNECTING THE 'BEFORE' AND 'AFTER'

PRICE WITH VAT IS 20% MORE THAN PRICE WITHOUT VAT

PRICE INC VAT = 1.2 × PRICE W/O VAT

$\frac{600}{1.2} = \frac{1.2 \times \text{PRICE W/O VAT}}{1.2}$

PRICE W/O VAT = $\frac{600}{1.2}$

= £500

$12\overline{)600}$ 50

$\frac{600}{12} = 50$

$\frac{600}{1.2} = 500$

Answer 4

(b) The increase in price of a flight to Mumbai was £48

Work out the price of a flight to Mumbai after the increase.

8% of original price = 48

$\therefore 48 = (\text{original}) \times 0.08$

$\text{original} = \frac{48}{0.08} = 600$

price after increase = 600 + 48 = 648

£ 648

Answer 5

Eloy's height at the age of 12 years was 85% of his height at the age of 20 years.

(b) Work out Eloy's height when his age was 20 years.

153 = 85% = 0.85
153/ 0.85 = 180cm

180 ..... cm

Answer 6

LOSE 12%. THINK: WE WANT 88%

Claire is making a loaf of bread

A loaf of bread loses 12% of its weight when it is baked.

Claire wants the baked loaf of bread to weigh 1.1 kg.

Work out the weight of the loaf of bread before it is baked.

(WEIGHT) (WEIGHT)

AFTER IS 88% OF BEFORE

$$\text{AFTER} = \frac{88}{100} \times \text{BEFORE}$$

$$\frac{1.1}{0.88} = \frac{0.88 \times \text{BEFORE}}{0.88}$$

$$\text{BEFORE} = \frac{1.1}{0.88} = 1.25\text{ kg}$$

PERCENTAGES

WRITE DOWN A STATEMENT CONNECTING THE 'BEFORE' AND 'AFTER'

PERCENTAGE DECREASES (THE BEST WAY!)

TO DECREASE BY, SAY, 3%

THINK: WE WANT 97%. SO WE MULTIPLY BY $\frac{97}{100}$ (=0.97)

Answer 7

The hospital has a target to reduce the average time patients wait to be treated in the Accident and Emergency department to 60 minutes in 2016

(b) Work out the percentage decrease from 68 minutes to 60 minutes.

PERCENTAGE DECREASE = $\frac{\text{ACTUAL DECREASE}}{\text{ORIGINAL VALUE}} \times 100$

$= \frac{8}{68} \times 100$

$= 11.8\%$

..... %

Answer 8

An airline increases the prices of its flights by 8%.

(a) Before the increase, the price of a flight to Cairo was £475

Work out the price of a flight to Cairo after the increase.

increase by 8% = multiply by 1·08

$475 \times 1{\cdot}08 = 513$

£ 513

Answer 9

Eloy's height was 125 cm when his age was 7 years.
His height was 153 cm when his age was 12 years.

(a) Work out the percentage increase in Eloy's height between the ages of 7 and 12 years.

Percentage increase =(difference / original) x 100

153-125 = 28

28/125 x 100 = 22.4

22.4 ..... %

Answer 10

In a sale normal prices are reduced by 20%.

A washing machine has a sale price of £464

By how much money is the normal price of the washing machine reduced?

SALE PRICE IS 80% OF NORMAL PRICE

$$SP = \frac{80}{100} \times NP$$

$$\frac{464}{0.8} = \frac{0.8 \times NP}{0.8}$$

$$NP = \frac{464}{0.8}$$

$$= £580$$

REDUCTION = 580 − 464

= £116

REVERSE PERCENTAGES

WRITE DOWN A STATEMENT CONNECTING THE TWO "THINGS"

Answer 11

On 9th May, 2009, there were 3440 people in the world with swine flu.
Of these people, 1639 were in the USA.

(a) Express 1639 as a percentage of 3440
Give your answer correct to 1 decimal place.

$\frac{1639}{3440} \times 100 = 47.6$

47.6 %

Answer 12

(a) Helen's savings increased from £155 to £167.40

Work out the percentage increase in Helen's savings.

(Difference / original)x 100= % increase

$$\frac{167.40-155}{155} = \frac{12.4}{155} = 0.08$$

0.08 x 100 = 8%

8 ..... %

Answer 13

In a sale, all normal prices are reduced by 15%.

(a) The normal price of a washing machine is 270 dollars.
Work out the sale price of the washing machine.

Reduction by 15% equivalent to multilple by .85

270 x 0.85 = 229.50

229.5 dollars

Answer 14

A clothes shop has a sale.

In the sale, normal prices are reduced by 12%
The normal price of a shirt is £30

(a) Work out the sale price of the shirt.

Reduction by 12 % = multiple by 0.88

30 x.88 = 26.4

£ 26.40

Answer 15

A shop has a sale.

Microwave ovens	Combination ovens
$\frac{1}{3}$ off normal price	40% off normal price

A microwave oven has a sale price of £90
A combination oven has a sale price of £84

Which of these ovens has the greater normal price?
You must show all your working.

PERCENTAGES
WRITE DOWN A STATEMENT CONNECTING THE 'BEFORE' AND 'AFTER'

COMBINATION

SALE PRICE IS 60% OF NORMAL PRICE

$SP = \frac{60}{100} \times NP$

$100 \times 84 = \frac{60}{100} \times NP \times 100$

$\frac{8400}{60} = \frac{60 \times NP}{60}$

$\frac{7 \times 12 \times 10 \times 10}{6 \times 10} = NP$

$NP = £140$

MICROWAVE

SALE PRICE IS $\frac{2}{3}$ OF NORMAL PRICE

$SP = \frac{2}{3} \times NP$

$3 \times 90 = \frac{2}{3} \times NP \times 3$

$\frac{270}{2} = \frac{2 \times NP}{2}$

$£135 = NP$

COMBINATION OVEN HAS GREATER PRICE