Lesson 6 – Increasing/Decreasing by a Percentage

Starter

Find:

1) 20% of 15 2) 35% of 60 3) 28% of 200 4) $\frac{2}{3}$ of 12 5) $\frac{3}{5}$ of 14

Starter Answers

1) 3 2) 21 3) 56 4) 8 5) 8.4

Example 1

Increase 30 by 15%

This means we want to make 30 15% bigger.
First we find 15% of 30:

Proportion	Amount
100%	30
10%	3
5%	1.5
15%	4.5

This is the amount we want to increase 30 by.
So we add 4.5 on to 30.

30 + 4.5 = 34.5

Answer = 34.5

Example 2

Decrease 30 by 15%

We know that 15% of 30 is 4.5
This time we want to decrease 30 by this amount which means we make the number smaller
So, we subtract 4.5 from 30.

30 – 4.5 = 25.5

Answer = 25.5

Example 3

Reduce 45 by 33%

First we find 33% of 45

Proportion	Amount
100%	45
10%	4.5
1%	0.45
30%	13.5
3%	1.35
33%	14.85

30% = 3 x 10% = 3 x 4.5
We can do this by doing 4.5 + 4.5 + 4.5 and use a column method

3% = 3 x 1% = 3 x 0.45

We can do this by doing 0.45 + 0.45 + 0.45

Reduce means to decrease or make smaller. So, we subtract 14.85 away from 45. We can do this using a column method.

$$\begin{array}{r} 4\,\cancel{5}^{\,4}.\,\cancel{0}^{\,9}\,0^{\,1\,1} \\ -\ 1\,4\,.\,8\,5 \\ \hline 3\,0\,.\,1\,5 \end{array}$$

Answer = 30.15

Your go

1) Increase 40 by 15%
2) Decrease £30 by 10%
3) Reduce 42kg by 30%
4) Add on 32% to 200ml
5) Raise $400 by 16%
6) Discount £60 by 12%

Answers

1) 15% of 40 = 6
40 + 6 = 46

2) 10% of 30 = 3
30 – 3 = 27

3) Reduce means to decrease.
30% of 42kg = 12.6kg
42kg – 12.6kg = 29.4kg

4) 32% of 200ml = 64ml
200ml + 64ml = 264ml

5) 16% of $400 = $64
$400 + $64 = $464

6) Discount means to decrease
12% of £60 = £7.20
£60 - £7.20 = £52.80

Example 4

In a sale, all prices are reduced by 15%.
What would the sale price of a coat be if it used to cost £70?

15% of £70 = £10.50

£70 - £10.50 = £59.50

The coat used to cost £59.50

Example 5

Anna is 165cm tall.
Fred is 10% taller than Anna.
Charlie is 10% smaller than Fred.
How tall is Charlie?

10% of 165cm is 16.5cm
Fred is taller than Anna so we add 16.5cm on to Anna's height.

165cm + 16.5cm = 181.5cm
Fred is 181.5cm tall.

10% of 181.5cm is 18.15cm
Charlie is smaller than Fred, so we subtract 18.15cm from Fred's height.

181.5cm – 18.15cm = 163.35cm

Charlie is 163.35cm tall.

Example 6

There are 200 counters in a bag.
The counters are either red, blue or green.
30% of the counters are red.
The number of blue counters is 15% higher than the number of red counters.
How many green counters are there?

30% of 200 is 60
There are 60 red counters

15% of 60 is 9
Add this on to the number of red counters: 60 + 9 = 69
There are 69 blue counters

200 – 60 – 69 = 71
There are 71 green counters