

**KING'S
MATHS
SCHOOL**

1) Draw a bar model:

So '?' represents 34 students

In Year 11 there are $5 \times 34 = 170$ students

In Year 10 there are $7 \times 34 = 238$ students

2a) Draw a bar model

$8 + 9 + 19 = 36$ '?' represents 180°

So '?' represents 5°

So the angles are 40° , 45° and 95°

The triangle is **not** right-angled.

b) Draw a bar model:

So '?' represents $224 \div 16 = 14$ cm

Length = $9 \times 14 = 126$ cm

Width = $7 \times 14 = 98$ cm

$$\text{Area} = 12,348 \text{ cm}^2$$

3a) “Reduce by 5% and then reduce by 20%”

is the same as $\times 0.95 \times 0.8$

is the same as $\times 0.76$

is the same as ‘reduce by 24%’

b)

| | Day 1 | | Day 2 |
|----------|-------|---|---------|
| Distance | d | Increase distance by 40% i.e. $\times 1.4$ | $1.4d$ |
| Speed | s | Decrease average speed by 20% i.e. $\times 0.8$ | $0.8s$ |
| Time | t | Using Time = $\frac{\text{Distance}}{\text{Speed}} = \frac{1.4d}{0.8s} = 1.75t$ | $1.75t$ |

Therefore, there is a 75% increase in the time taken.

4a) It takes 9 sheep 15 days to graze a pasture of area 3 acres. How long does it take 15 sheep to graze a pasture of area 7 acres?

- “more acres” increases “time taken” by a scale factor of $\frac{7}{3}$
- “more sheep” decreases “time taken” by a scale factor of $\frac{9}{15}$
- $15 \times \frac{7}{3} \times \frac{9}{15} = 21$ days.

So, they take 21 days.

b) 5 bears catch 45 salmon in 3 hours. 9 bears catch in 5 hours ...

- “more bears” increases “salmon caught” by a scale factor of $\frac{9}{5}$
- “more time” increases “salmon caught” by a scale factor of $\frac{5}{3}$
- $45 \times \frac{9}{5} \times \frac{5}{3} = 135$ salmon

So, they catch 135 salmon.

5) 2250 voters is 30% of electorate, so total electorate is $2250 \div 0.3 = 7500$

- 8% of 7500 = 600 votes for B

Undecided voters represent $100 - 20 - 8 - 30 = 42\%$.

- 42% of 7500 = 3150

| | | | | | | | |
|---|---|--|--|--|--|--|--|
| A | ? | | | | | | |
| B | | | | | | | |

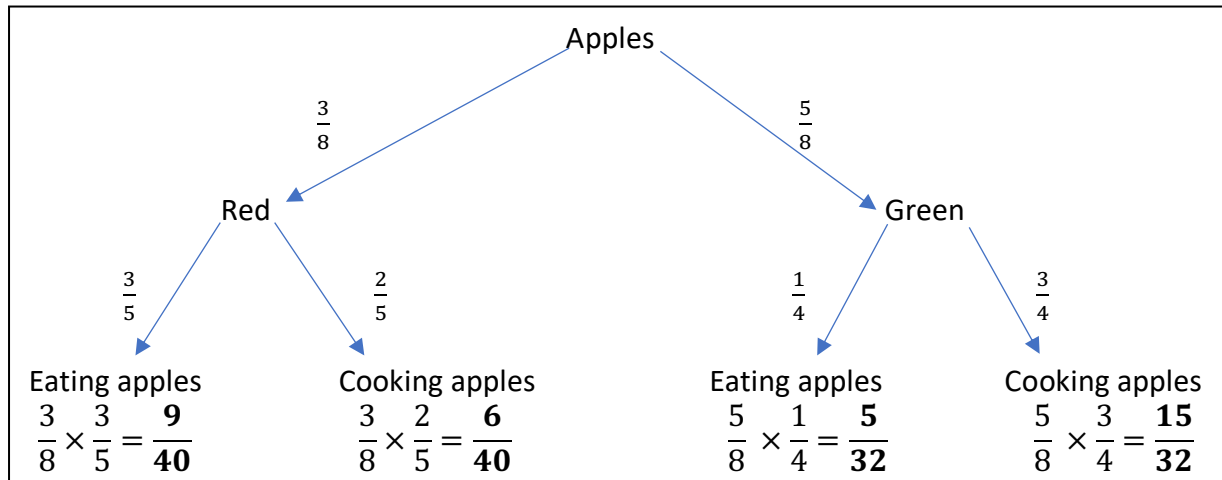
= 3150

So ‘?’ represents $3150 \div 7 = 450$ voters

B gets $5 \times 450 = 2250$ votes

In total B gets $2250 + 600 = 2850$ votes

6) Draw a tree diagram



The ratio "Eating apples": "Cooking apples"

$$= \left(\frac{9}{40} + \frac{5}{32} \right) : \left(\frac{6}{40} + \frac{15}{32} \right)$$

$$= \frac{36 + 25}{160} : \frac{24 + 75}{160}$$

$$= \frac{61}{160} : \frac{99}{160}$$

$$= 61 : 99$$