

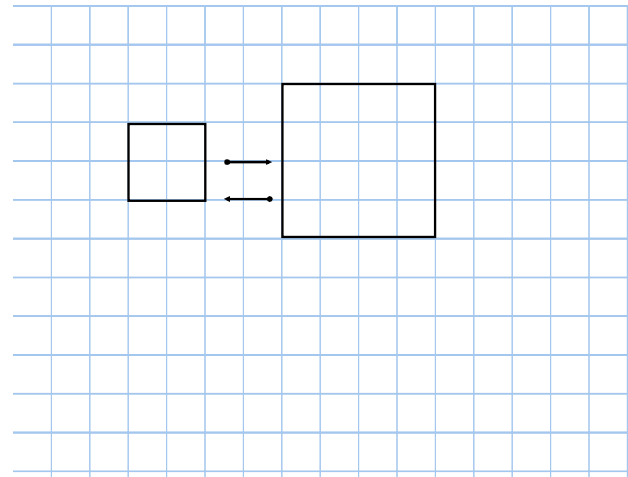
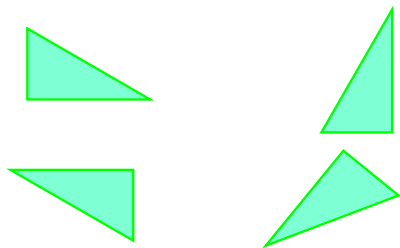
Daily Practice 13.9.2017

- Q1. Find 60% of 89
 $10\% \text{ of } 89 = 8.9$
 $60\% \text{ of } 89 = \frac{6}{10} \times 89$
- Q2. Multiply out and simplify $3(2y - 1) + 4(y - 8)$
 $6y - 3 + 4y - 32$
 $10y - 35$
- Q3. Share £350 in the ratio 2:5
 $\frac{50}{350} \times \frac{50}{100} = \frac{50}{700}$
 $\frac{50}{700} \times 350 = 25$
- Q4. $6.71 \times 500 = 6.71 \times 100 = 671$
 $\times \frac{5}{10}$
 $\frac{3355}{2}$
- Q5. $2\frac{1}{3} - 1\frac{2}{3} = \frac{11}{3} - \frac{5}{3}$
 $= \frac{33}{15} - \frac{25}{15} = \frac{8}{15}$

L1: Today we will be learning about congruent & similar shapes

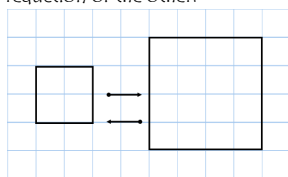
Congruent Shapes

Two shapes are congruent if they are exactly the same shape and size.
 One may be a rotation or translation of the other.



Similar Shapes

Two shapes are **similar** if they are the same shape but one is an enlargement or reduction of the other.



Similar shapes have **equal corresponding angles** and their **corresponding sides are in the same ratio**.

Similar Shapes

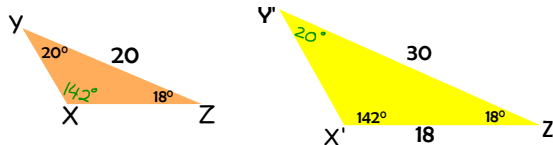
The scale factor is the multiplier for which the shape has been enlarged or reduced in size.

All sides will have been increased/reduced by the same scale factor for the shapes to be similar.

Similar Shapes

Examples:

1. (i) Explain why the triangles below are similar



Angles are equal for both shapes, therefore they are similar.

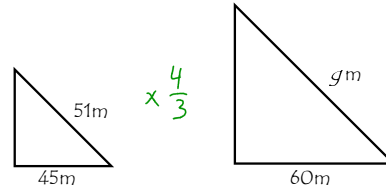
(ii) Calculate the length of XZ

S.f. = $\frac{3}{2}$ or 1.5
 $XZ = 18 \div 1.5 = 12$

or S.f. = $\frac{2}{3}$
 $XZ = 18 \times \frac{2}{3} = 12$

Similar Shapes

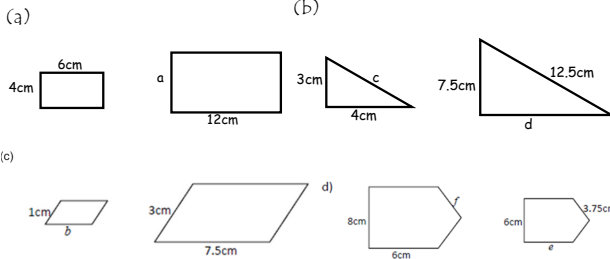
2. Calculate the length of g



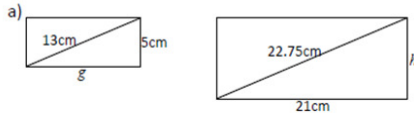
S.f. = $\frac{60}{45} = \frac{4}{3}$ or 1.3
 $g = 51 \times \frac{4}{3} = 68m$

Similar Shapes

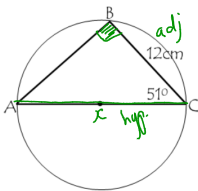
For each pair of similar shapes, find the missing lengths



2. Find the missing lengths in these similar shapes



L.I: Today we are going to continue working out missing sides in similar shapes.



Given that $BC = 12cm$ and that angle ACB is 51° . Find the length of the diameter AC

$\cos 51^\circ = \frac{12}{x}$
 $x \cos 51^\circ = 12$
 $x = \frac{12}{\cos 51^\circ} = 19.1cm$

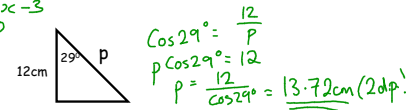
Daily Practice

14.9.2017

Q1. Multiply out and simplify $7(2x - 1) + 4x - 3$

$14x - 7 + 4x - 3$
 $18x - 10$

Q2. Find the value of p



$\cos 29^\circ = \frac{12}{p}$
 $p \cos 29^\circ = 12$
 $p = \frac{12}{\cos 29^\circ} = 13.72cm$ (2dp)

Q3. Write 67000 in scientific notation

6.7×10^4

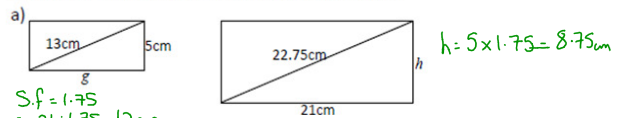
Q4. Round 7152.88 to 3 significant figures

7150

Q5. $\frac{1\frac{2}{5} \times \frac{3}{8}}{\frac{7}{5}} = \frac{16}{40} - \frac{15}{40} = \frac{1}{40}$

Similar Shapes

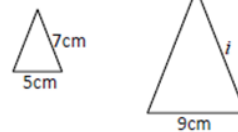
2. Find the missing lengths in these similar shapes



S.f. = 1.75
 $g = 21 \div 1.75 = 12cm$

$h = 5 \times 1.75 = 8.75cm$

b)

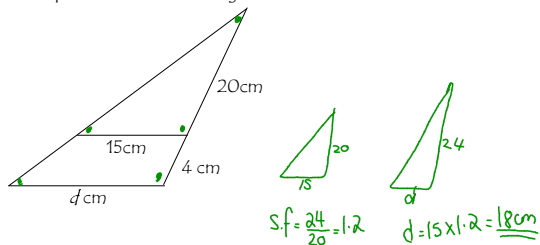


S.f. = $9 \div 5 = 1.8$
 $i = 1.8 \times 7 = 12.6cm$

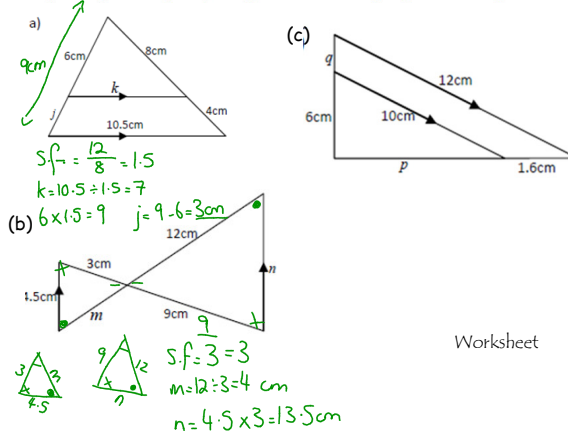
Similar Shapes

Sometimes similar shapes can be within the same shape.

Example: Calculate the length of d



3. By drawing both triangles separately, work out the missing lengths in these diagrams.



Worksheet

Daily Practice

15.9.2017

Q1. Round 89.778 to (i) 1 decimal place (ii) to 2 s.f.

89.8 → 90

Q2. Solve the equation $3(x+2) - 4(x-5) = 15$

$$3x + 6 - 4x + 20 = 15$$

$$-x + 26 = 15$$

$$-x = -11$$

$$x = 11$$

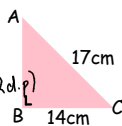
Q3. Find the length of AB

$$x^2 = 17^2 - 14^2$$

$$x^2 = 93$$

$$x = \sqrt{93}$$

AB = 9.64cm (2d.p.)



Q4. $\frac{4}{5} \div \frac{2}{3}$

$$\frac{4}{5} \times \frac{3}{2} = \frac{12}{10} = \frac{6}{5}$$

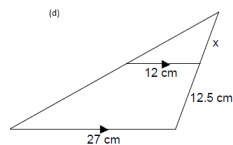
Q5. Find the length of p

$$\cos 41^\circ = \frac{p}{19}$$

$$p = 19 \cos 41^\circ = 14.34 \text{ cm (2d.p.)}$$



Today we will be continuing to practise scale factor questions.



S.f. = $\frac{27}{12} = 2.25$

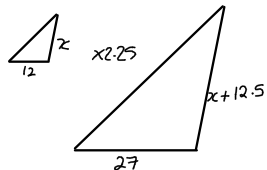
$$2.25 \times x = x + 12.5$$

$$2.25x = x + 12.5$$

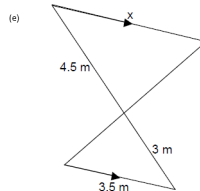
$$-x \quad -x$$

$$1.25x = 12.5$$

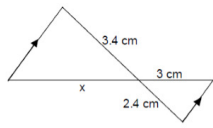
$$x = \underline{10 \text{ cm}}$$



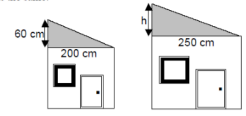
$$\frac{x+12.5}{2.25} = x$$



f)

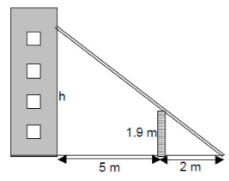


2. The Select Shed Co. sell two different sizes of shed. The angle of slope of each roof is the same.



Calculate h.

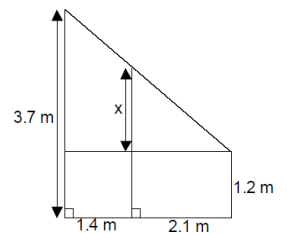
3. The foot of window cleaner's ladder is 2 metres from the base of a wall and rests against a block of flats a further 5 metres away.



Calculate h, how far up the block of flats the ladder reaches.

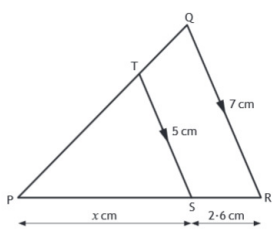
To increase safety an extra pillar is added to support the straight run of the slide, as shown opposite..

Calculate x and hence find the height of the extra pillar.



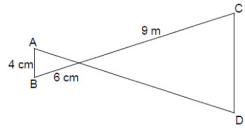
In the diagram below:

- TS is parallel to QR
- TS = 5 centimetres
- QR = 7 centimetres
- SR = 2.6 centimetres



The length of PS is x centimetres.
Calculate the value of x.

4. The diagram below shows the position of a slide as it is placed in a projector and the resulting picture on a screen. The position of the slide AB is parallel to the screen CD.



Calculate the height of the screen CD.

Daily Practice 20.9.2017

Q1. Multiply out and simplify $7(2x - 3) + 2(x + 1) - 5x$

$$14x - 21 + 2x + 2 - 5x$$

$$11x - 19$$

Q2. Solve the equation $0.5x + 3 = 24$

$$0.5x = 21$$

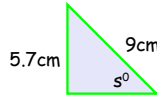
$$x = 42$$

Q3. Calculate the mean, median & mode of 3, 2, -1, 5, 6

No mode mean = $\frac{15}{5} = 3$

-1, 2, 3, 5, 6
median = 3

Q4. Find the value of s



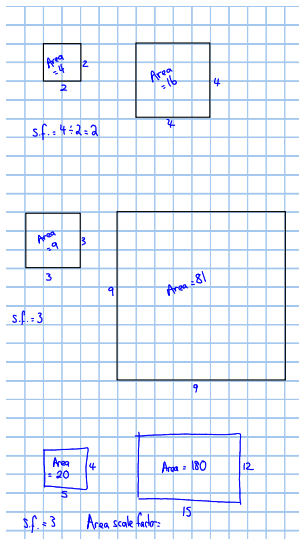
$$\sin s = \frac{5.7}{9}$$

$$s = \sin^{-1}\left(\frac{5.7}{9}\right) = 39.3^\circ \text{ (to 1 d.p.)}$$

Q5. $2\frac{4}{7} - \frac{1}{2}$

$$\frac{18}{7} - \frac{1}{2} = \frac{36}{14} - \frac{7}{14} = \frac{29}{14} = 2\frac{1}{14}$$

L.I: Today we will be learning about area scale factor.



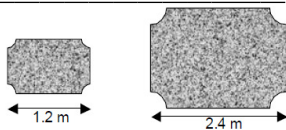
Area Scale Factor

$$\text{Area scale Factor} = (\text{Length scale factor})^2$$

Area Scale Factor

1. Two kitchen worktops are similar in shape. The area of the smaller worktop is 6.8 m^2 .

Calculate the area of the larger worktop.



$$s.f. = \frac{2.4}{1.2} = 2$$

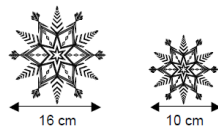
$$A.s.f. = 2^2 = 4$$

$$\text{Area larger worktop} = 6.8 \times 2^2 = 27.2 \text{ m}^2$$

2.

Two Christmas decorations are mathematically similar in shape. The larger decoration has an area of 128 cm^2 .

Calculate the area of the smaller decoration.



$$s.f. = \frac{16}{10} = 1.6$$

$$A.s.f. = 1.6^2 = 2.56$$

$$\text{Smaller decoration} = 128 \div 2.56 = 50 \text{ cm}^2$$

Daily Practice

21.9.2017

Q1. Write the formula $hy + k = 2x$ in terms of y

$$hy = 2x - k$$

$$y = \frac{2x - k}{h}$$

Q2. Solve the equation $3x - 4 = 2(x - 7)$

$$3x - 4 = 2x - 14$$

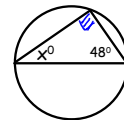
$$x - 4 = -14$$

$$x = -10$$

Q3. State the size of the angle x

$$180^\circ - (90^\circ + 48^\circ)$$

$$x = 42^\circ$$



Q4. 567.22×400

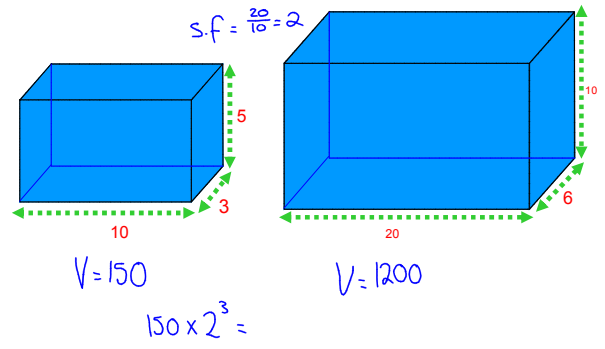
$$567.22 \times 100 = \frac{56722}{4}$$

$$= 14180.5$$

Q5. $2\frac{1}{3} \div \frac{3}{4}$

$$\frac{7}{3} \times \frac{4}{3} = \frac{28}{9} = 3\frac{1}{9}$$

Today we will be learning how to calculate volume scale factor.



Volume Scale Factor

Volume scale Factor = (Length scale factor)³

Volume Scale Factor

From Teejay Book

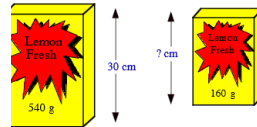
$s.f. = \frac{15}{7.5} = 2$

$V.s.f. = 2^3$

Volume larger can $64 \times 2^3 = 512 \text{ cm}^3$

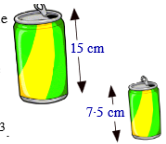
2.

Two boxes of soap powder are **similar**.
When full, the small one weighs 160 grams and the large one, 540 grams.



If the large box is 30 centimetres in height, what is the height of the small box?

1. These two tins of lime juice are **similar**.
Calculate the volume of the larger tin if the volume of the smaller one is 64 cm^3 .



$V.s.f. = \frac{540}{160} = 3.375$

$s.f. = \sqrt[3]{3.375} = 1.5$

$h = 30 \div 1.5 = 20 \text{ cm}$ height of smaller box.

Today we will be completing a check-up on similar shapes.

Topics to revise for test Unit 2 Level 4:

- Changing the subject of a formula.
- Right-Angled Trigonometry including bearings.
- Angles in triangles & Circles.
- Proportion
- Similar Shapes.