

#### 4.4 Homework

#### GCSE Mathematics Ratio and Similarity

Marks Available : 40

##### Question 1

*Do not use a calculator*

(i)

$$\left(\frac{3}{2}\right)^2 = \frac{9}{\quad}$$

(ii)

$$\left(\frac{8}{13}\right)^2 = \frac{\quad}{169}$$

(iii)

$$\left(\frac{5}{6}\right)^2 = \frac{\quad}{\quad}$$

(iv)

$$\left(\frac{2}{3}\right)^3 = \frac{8}{\quad}$$

(v)

$$\left(\frac{5}{7}\right)^3 = \frac{\quad}{343}$$

(vi)

$$\left(\frac{7}{4}\right)^3 = \frac{\quad}{\quad}$$

(vii)

$$\left(\frac{25}{4}\right)^{0.5} = \frac{5}{\quad}$$

(viii)

$$\left(\frac{49}{196}\right)^{0.5} = \frac{\quad}{14}$$

(ix)

$$\left(\frac{36}{121}\right)^{0.5} = \frac{\quad}{\quad}$$

(x)

$$\left(\frac{9}{64}\right)^{\frac{1}{2}} = \frac{\quad}{\quad}$$

(xi)

$$\left(\frac{1}{144}\right)^{\frac{1}{2}} = \frac{\quad}{\quad}$$

(xii)

$$\left(\frac{196}{169}\right)^{\frac{1}{2}} = \frac{\quad}{\quad}$$

(xiii)

$$\left(\frac{8}{27}\right)^{\frac{1}{3}} = \frac{\quad}{\quad}$$

(xiv)

$$\left(\frac{1}{1000}\right)^{\frac{1}{3}} = \frac{\quad}{\quad}$$

(xv)

$$\left(\frac{64}{125}\right)^{\frac{1}{3}} = \frac{\quad}{\quad}$$

(xvi)

$$\left(\frac{40}{9}\right)^2 = \frac{\quad}{\quad}$$

(xvii)

$$\left(\frac{5}{4}\right)^3 = \frac{\quad}{\quad}$$

(xviii)

$$\left(\frac{5}{6}\right)^0 = \frac{\quad}{\quad}$$

[ 18 marks ]

## Question 2

To square root the following fractions, first cancel down by repeated division of the numerator and denominator by 2, 3, 5 or 10.

### Example

$$\sqrt{\frac{484}{64}} = \sqrt{\frac{242}{32}} = \sqrt{\frac{121}{16}} = \frac{11}{4}$$

*Do not use a calculator*

(i)

$$\sqrt{\frac{27}{12}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

*Hint : Divide by 3*

[ 2 marks ]

(ii)

$$\sqrt{\frac{98}{50}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

[ 2 marks ]

(iii)

$$\sqrt{\frac{980}{720}} = \sqrt{\frac{\quad}{\quad}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

*Hint : First, divide by 10*

[ 2 marks ]

(iv)

$$\sqrt{\frac{45}{80}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

[ 2 marks ]

(v)

$$\sqrt{\frac{3630}{750}} = \sqrt{\frac{\quad}{\quad}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

[ 2 marks ]

(vi)

$$\sqrt{\frac{882}{162}} = \sqrt{\frac{\quad}{\quad}} = \sqrt{\frac{\quad}{\quad}} = \sqrt{\frac{\quad}{\quad}} = \frac{\quad}{\quad}$$

[ 2 marks ]

### Question 3

You may use a calculator

Here are two similar triangles.

$AB$  corresponds to  $PQ$ .

$BC$  corresponds to  $QR$ .

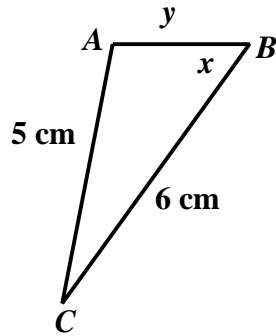
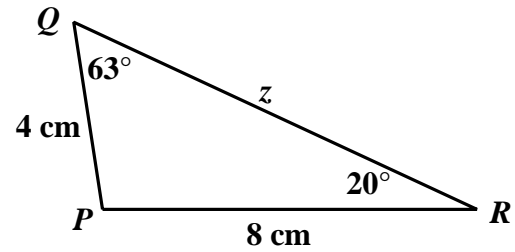


Diagram NOT accurately drawn



Find the value of

(a)  $x$

(b)  $y$

(c)  $z$

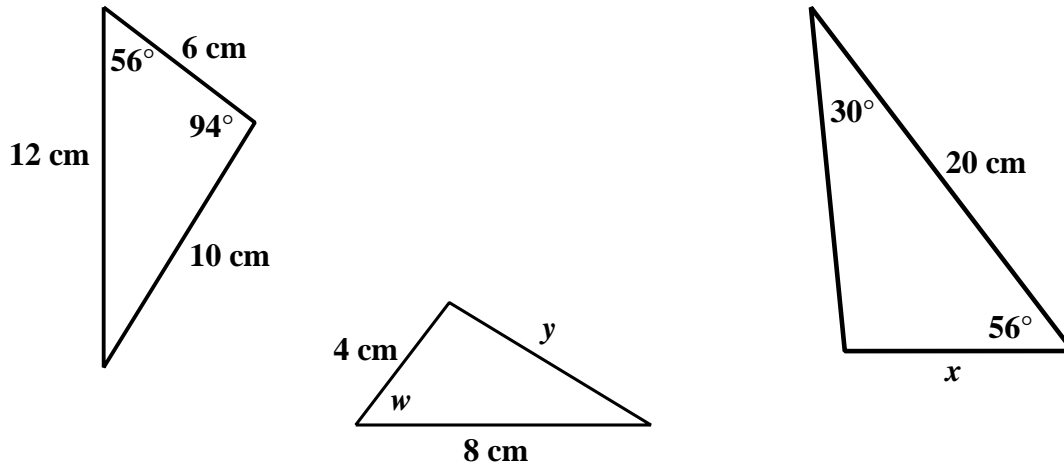
[ 5 marks ]

### Question 4

You may use a calculator

Here are three similar triangles.

Diagram NOT accurately drawn



Find the value of

(a)  $w$

(b)  $x$

(c)  $y$

[ 5 marks ]

This document is a part of a **Mathematics Community Outreach Project** initiated by Shrewsbury School

It may be freely duplicated and distributed, unaltered, for non-profit educational use

In October 2020, Shrewsbury School was voted "**Independent School of the Year 2020**"

© 2022 Number Wonder

Teachers may obtain detailed worked solutions to the exercises by email from [mhh@shrewsbury.org.uk](mailto:mhh@shrewsbury.org.uk)