KING EDWARD VI
HANDSWORTH GRAMMAR
SCHOOL FOR BOYS

KING EDWARD VI
ACADEMY TRUST
BIRMINGHAM

Year 7
2024 Mathematics 2025
Unit 5 Booklet

HGS Maths

Tasks

Dr Frost Course

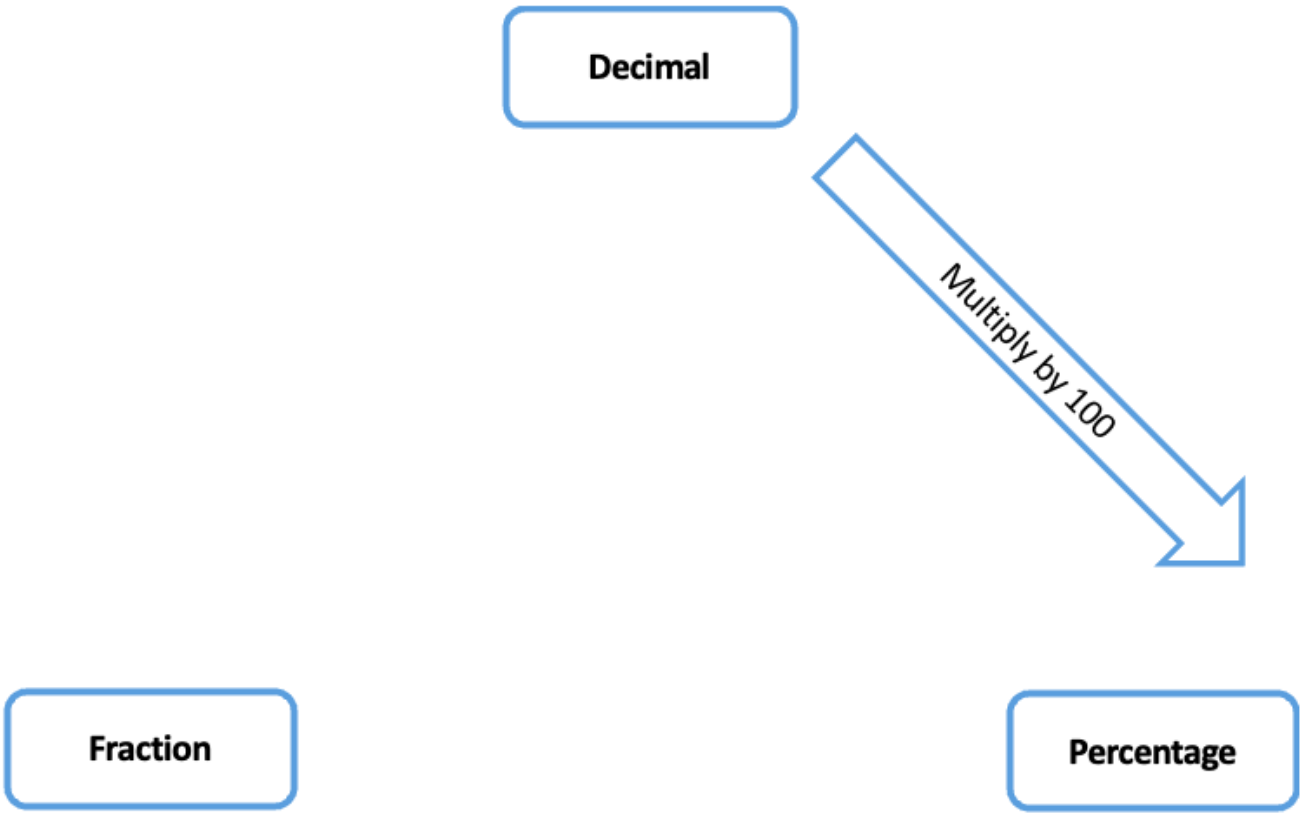
Name: _____

Class: _____

Contents

1 Fractions, Decimals and Percentages

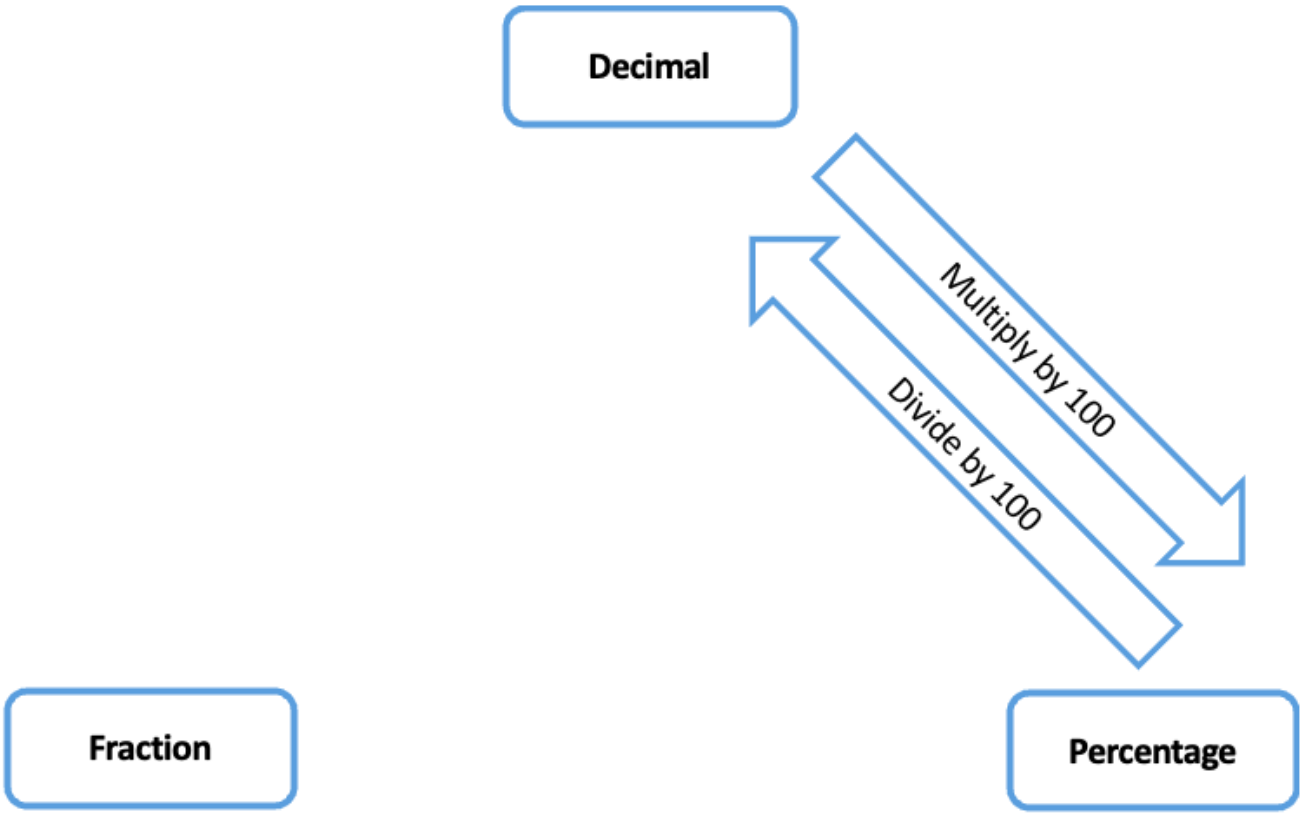
1.1 Decimals to Percentages



Worked Example	Your Turn
Convert the following decimals into percentages: a) 0.7 b) 0.37 c) 0.037 d) 3.7	Convert the following decimals into percentages: a) 0.8 b) 0.38 c) 0.038 d) 3.8

Dr Frost 106b, 106c and 172i

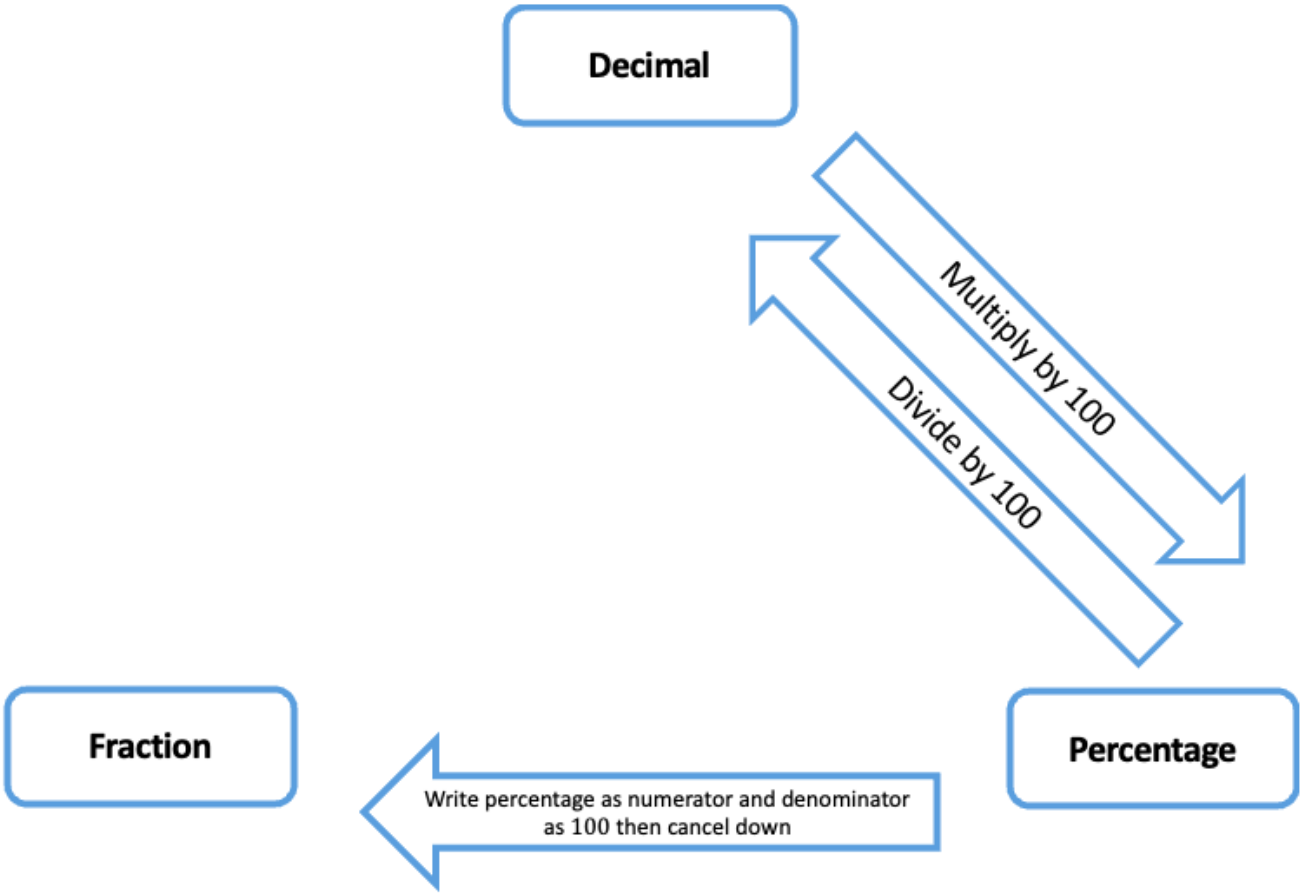
1.2 Percentages to Decimals



Worked Example	Your Turn
Convert the following percentages into decimals: a) 82% b) 8.2% c) 820%	Convert the following percentages into decimals: a) 81% b) 8.1% c) 810%

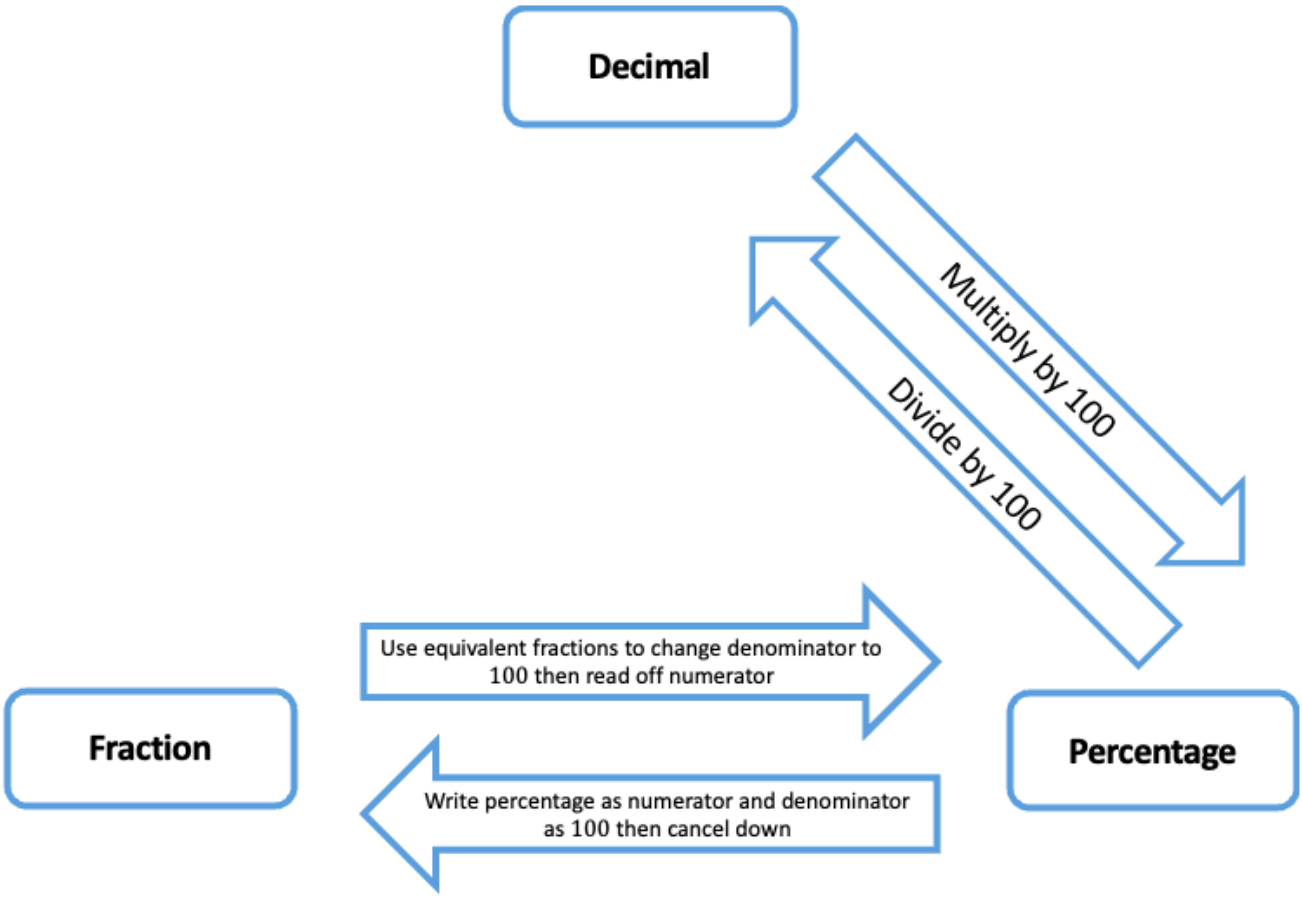
Dr Frost 106a and 172j

1.3 Percentages to Fractions



Worked Example	Your Turn
Convert the following percentages into fractions in their simplest form: a) 6% b) 66% c) 66.6% d) 666%	Convert the following percentages into fractions in their simplest form: a) 8% b) 88% c) 88.8% d) 888%

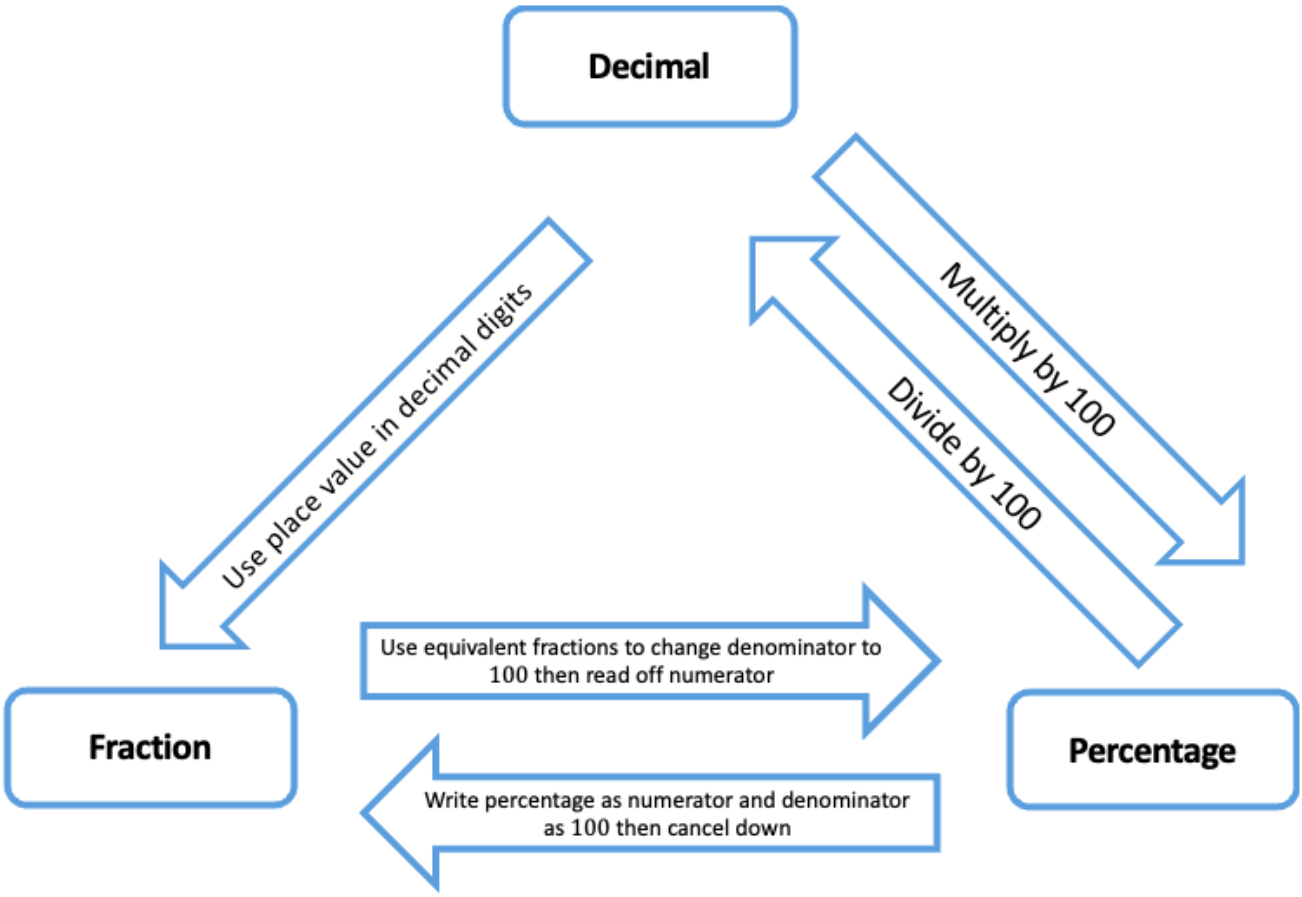
1.4 Fractions to Percentages



Worked Example	Your Turn
Convert the following fractions into percentages: a) $\frac{6}{10}$ b) $\frac{6}{5}$ c) $\frac{6}{60}$ d) $\frac{6}{600}$	Convert the following fractions into percentages: a) $\frac{8}{10}$ b) $\frac{8}{5}$ c) $\frac{8}{40}$ d) $\frac{8}{400}$

Dr Frost 172d and 172e

1.5 Decimals to Fractions



Frayer Model – Terminating Decimal

Definition	**Characteristics**
Examples	**Non-Examples**

Worked Example	Your Turn
Convert the following decimals into fractions in their simplest form: a) 0.8 b) 0.08 c) 0.085 d) 8.5	Convert the following decimals into fractions in their simplest form: a) 0.2 b) 0.02 c) 0.025 d) 2.5

Dr Frost 172f and 172h

1.6 Recurring Decimal Notation

- $0.123\dot{4}$

- $0.\dot{6}$

- $2.\dot{3}\dot{7}$

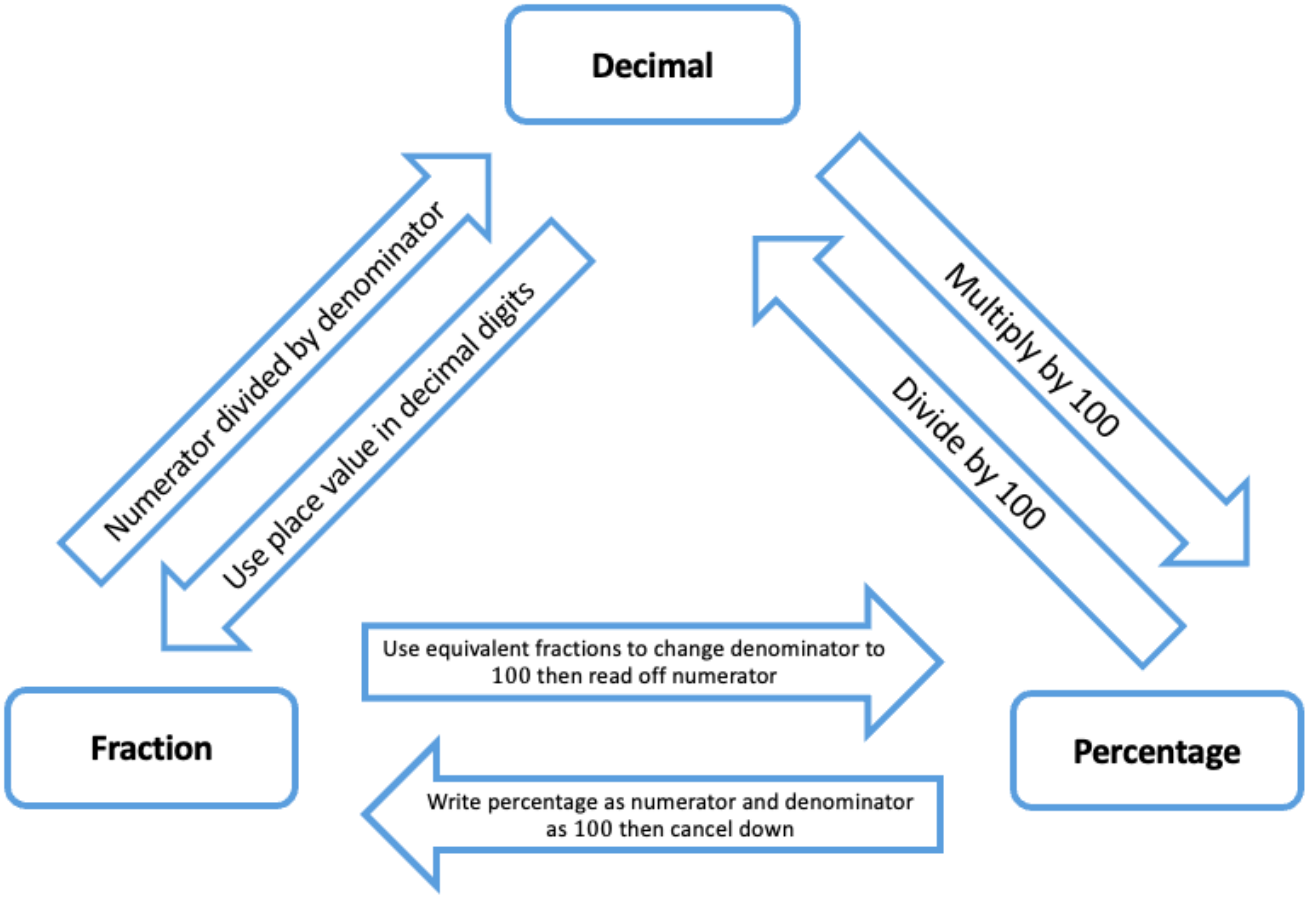
- $0.\dot{1}42857\dot{}$

- $7846.1\dot{3}$

Frayer Model – Recurring Decimal

Definition	**Characteristics**
Examples	**Non-Examples**

1.7 Fractions to Decimals



Worked Example	Your Turn
Convert the following fractions into decimals: a) $\frac{1}{8}$ b) $\frac{2}{3}$ c) $\frac{2}{15}$	Convert the following fractions into decimals: a) $\frac{3}{8}$ b) $\frac{2}{9}$ c) $\frac{5}{12}$

Dr Frost 172c and 173a

2 Ordering Numbers

2.1 Ordering Negative Numbers

Worked Example	Your Turn
Write in ascending order: $-2, -1, 4, 3$	Write in ascending order: $-7, -8, 8, 7$

2.2 Ordering Decimals

Worked Example	Your Turn
Write in ascending order: $0.5037, 0.5, 0.53, 0.503, 0.5007$	Write in ascending order: $0.2089, 0.2, 0.28, 0.208, 0.2009$

2.3 Ordering Fractions

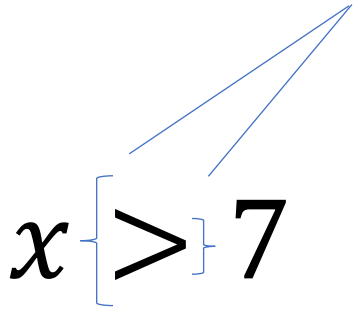
Worked Example	Your Turn
Arrange the following fractions in ascending order: a) $\frac{3}{10}, \frac{5}{10}, \frac{1}{10}, \frac{4}{10}$ b) $\frac{1}{2}, \frac{3}{5}, \frac{3}{4}, \frac{7}{10}$	Arrange the following fractions in ascending order: a) $\frac{5}{8}, \frac{7}{8}, \frac{3}{8}, \frac{6}{8}$ b) $\frac{1}{2}, \frac{5}{6}, \frac{3}{4}, \frac{7}{8}$

2.4 Ordering FDP

Worked Example	Your Turn
Write in ascending order: $\frac{17}{25}, 0.18, 90\%, 81\%, 0.39$	Write in ascending order: $27\%, \frac{79}{100}, \frac{9}{50}, 0.91, 0.46$

2.5 Inequalities

Notice the symbol is taller on the side which is larger.



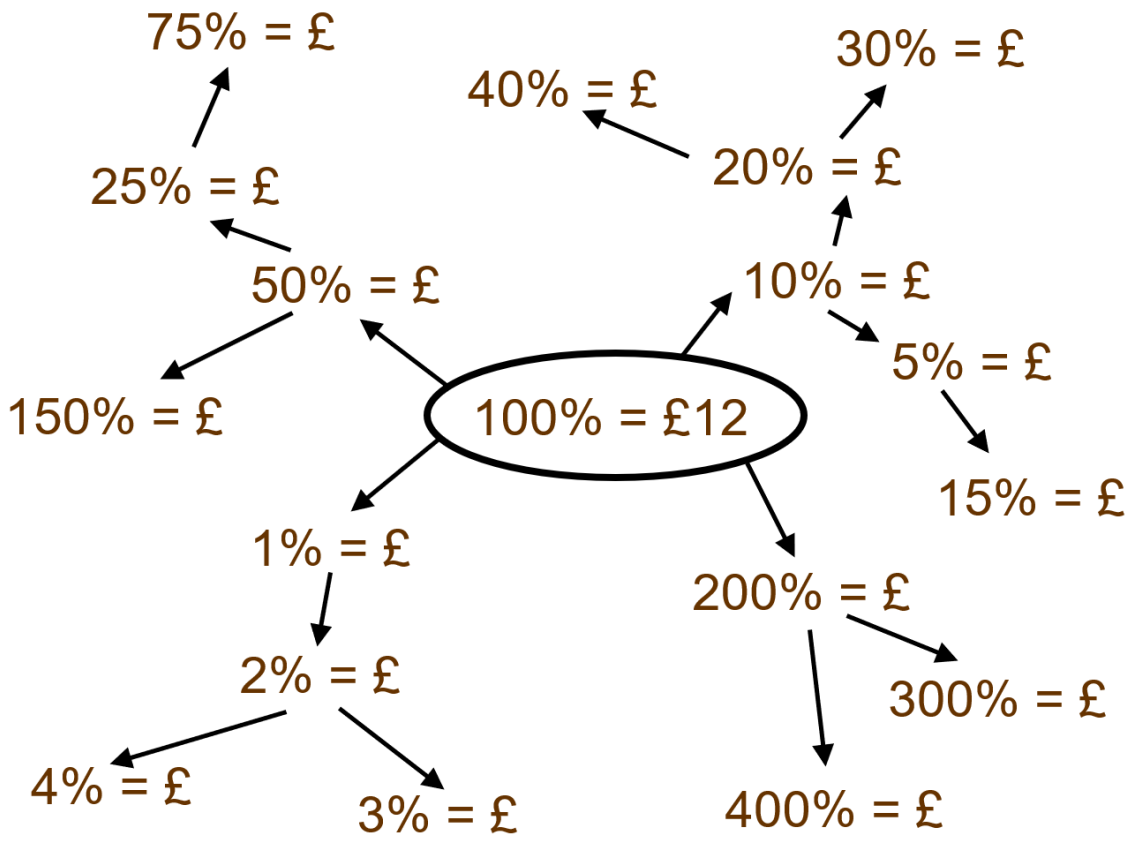
Inequality	What It Means
$x > 7$	"x is greater than 7" This doesn't include 7 Examples: $7.2, 10$
$x \geq 7$	"x is greater than or equal to 7" or "x is at least 7" This does include 7 Examples: $7, 8, 100.5$
$x < 10$	"x is less than 10" Examples: $-3, 4, 9.2$
$x \leq 8$	"x is less than or equal to 8" or "x is at most 8" Examples: $8, -3, 4, 7.2$

Worked Example	Your Turn
Write an inequality in between the two numbers: a) $-4 \quad -5$ b) $4.1 \quad 4.11$	Write an inequality in between the two numbers: a) $-3 \quad -2$ b) $3.12 \quad 3.2$

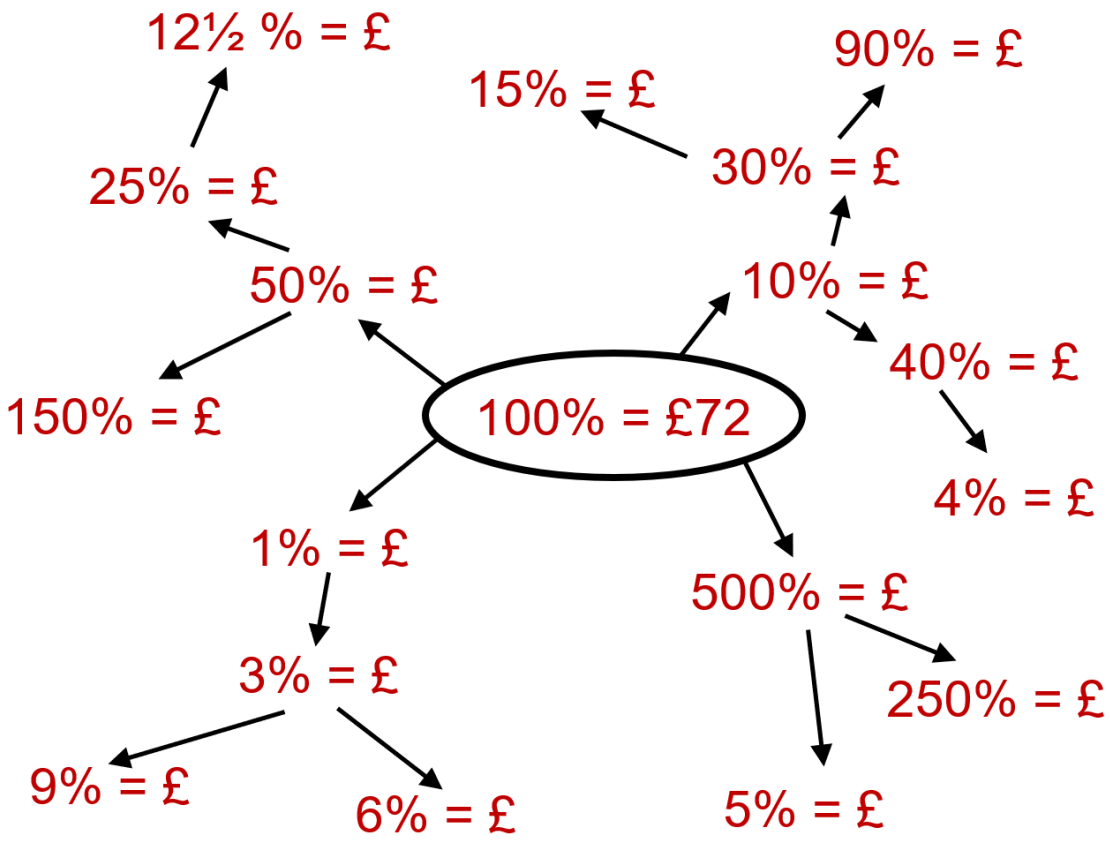
3 Percentages

3.1 Percentages of Amounts

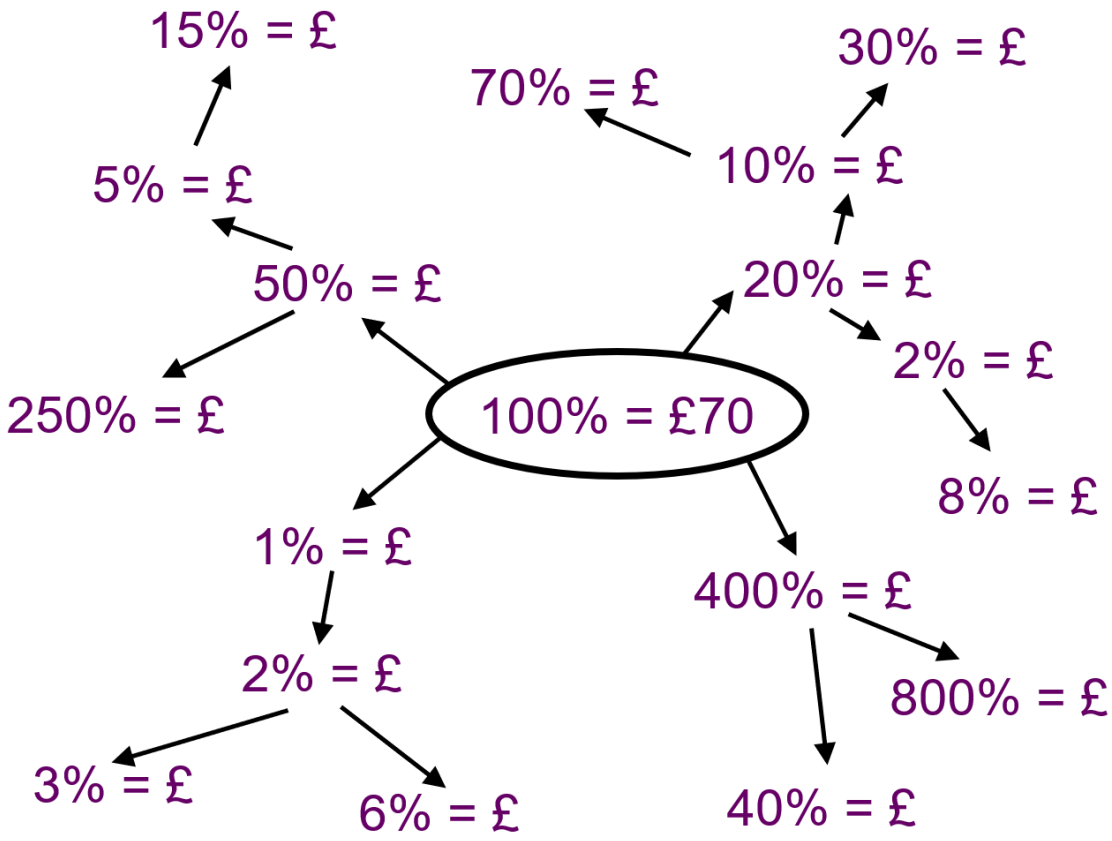
Worked Example



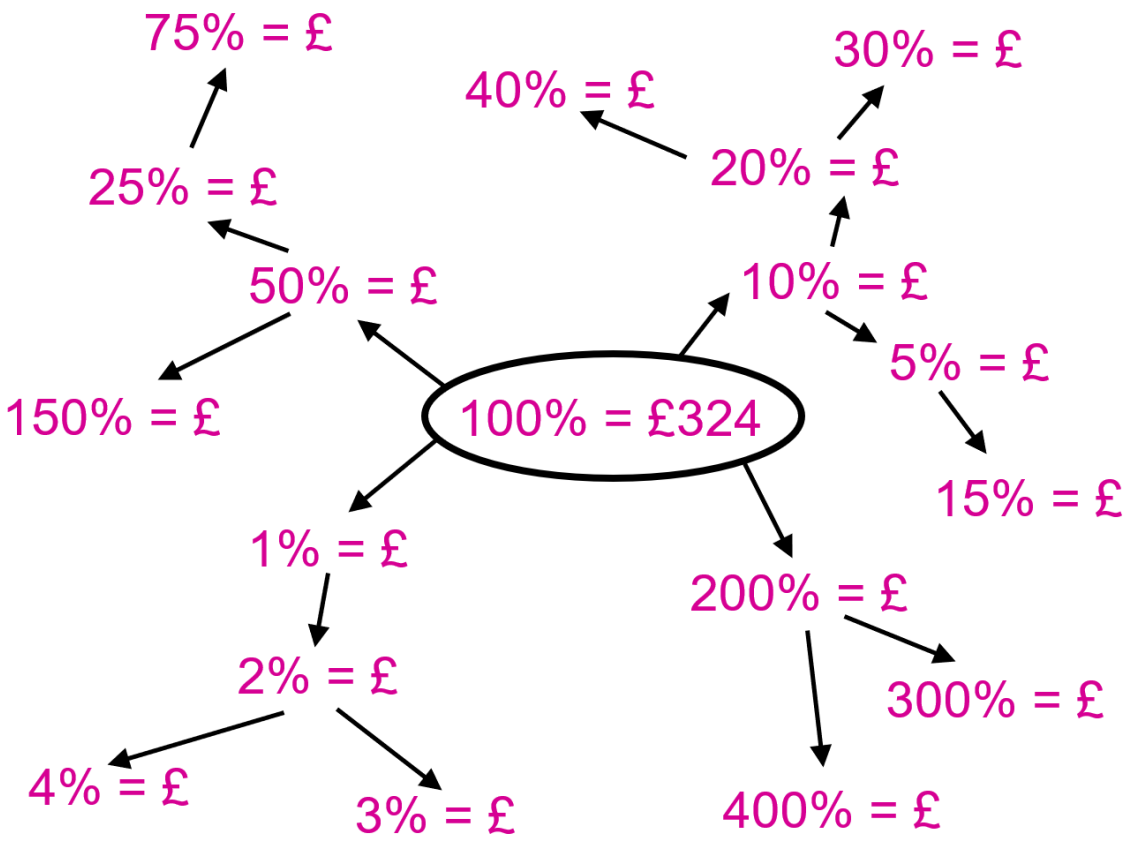
Your Turn



Your Turn



Your Turn



3.2 Percentage Increase

Worked Example	Your Turn
Increase 40 by 20%	Increase 90 by 20%

3.3 Percentage Decrease

Worked Example	Your Turn
Decrease 40 by 20%	Decrease 90 by 20%

3.4 Percentage Change

Worked Example	Your Turn
Calculate the percentage change: a) Original value: £400 New value: £360 b) Original value: £400 New value: £440	Calculate the percentage change: a) Original value: £200 New value: £150 b) Original value: £200 New value: £250

Worked Example	Your Turn
Djamel buys 160 video games for £12 each. He sells $\frac{3}{8}$ of the games for £16.56 each. He sells 30% of the games for £14.24 each. He sells the rest of the games for £13.52 each. Calculate his percentage profit.	Ruby buys 560 house plants for £15 each. She sells $\frac{5}{7}$ of the plants for £18.30 each. She sells 20% of the plants for £16.10 each. She sells the rest of the plants for £13.68 each. Calculate her percentage profit.

3.5 Reverse Percentages

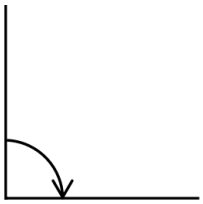
Worked Example	Your Turn
Calculate the original amount: a) Percentage change: 10% decrease New value: £360 b) Percentage change: 10% increase New value: £440	Calculate the original amount: a) Percentage change: 25% decrease New value: £150 b) Percentage change: 25% increase New value: £250

Worked Example	Your Turn
a) The price of an online Maths website subscription is increased by 64% and now is $528.08. Find the original price. b) The price of a calculator is decreased by 29% and now is $115.02. Find the original price.	a) The price of an online Maths website subscription is decreased by 42% and now is $87.58. Find the original price. b) The price of a calculator is increased by 67% and now is $475.95. Find the original price.

Worked Example	Your Turn
In a 39% sale, the price of a jacket reduced by $28.86. Find the original price.	In a 17% sale, the price of a jacket reduced by $53.72. Find the original price.

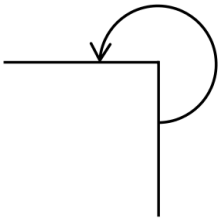
4 Angle Basics

4.1 Types of Turns and Angles

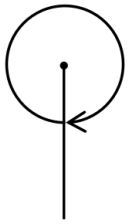


A quarter of a turn clockwise

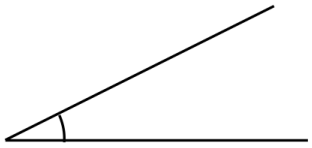
Half a turn anticlockwise



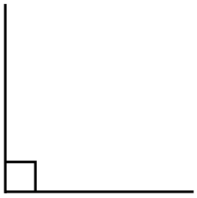
Three quarters of a turn anticlockwise



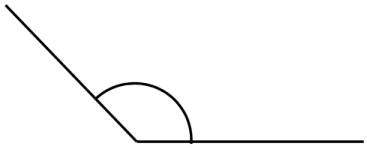
A full turn clockwise



Acute Angle

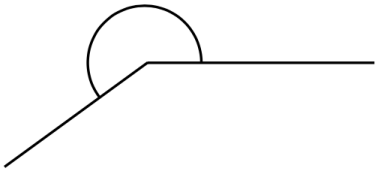


Right Angle

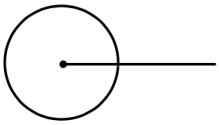


Obtuse Angle

Straight Line



Reflex Angle

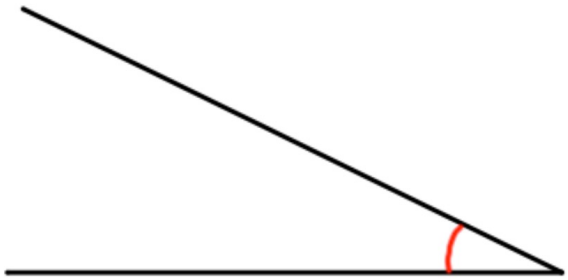


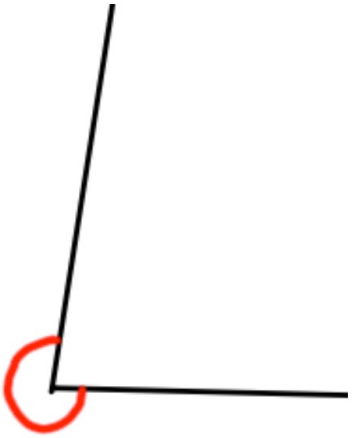
Full Turn

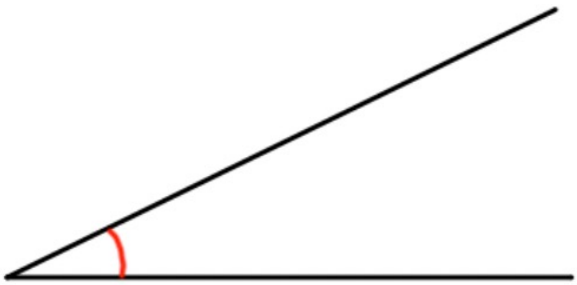
Acute	Right	Obtuse	Straight	Reflex	Full turn
$0° < \theta < 90°$	$90° = \theta$	$90° < \theta < 180°$	$180° = \theta$	$180° < \theta < 360°$	$360° = \theta$

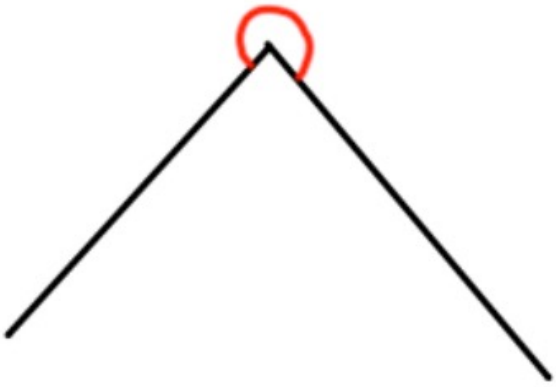
4.2 Estimating Angles

Worked Example	Your Turn
Estimate the angles below.	Estimate the angles below.



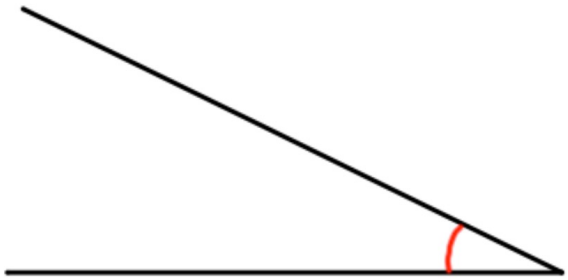


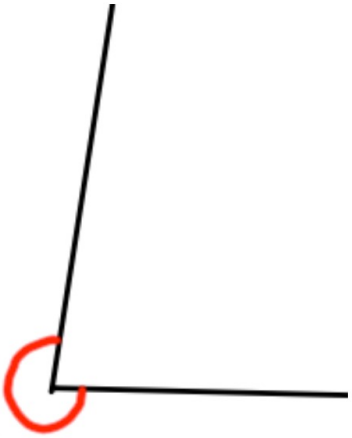


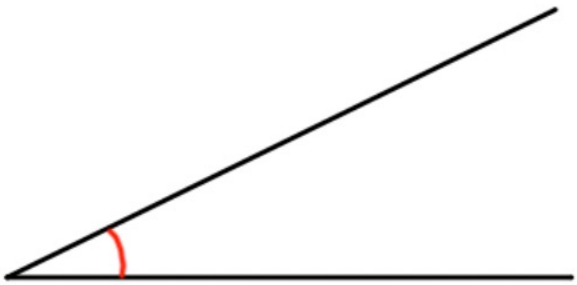


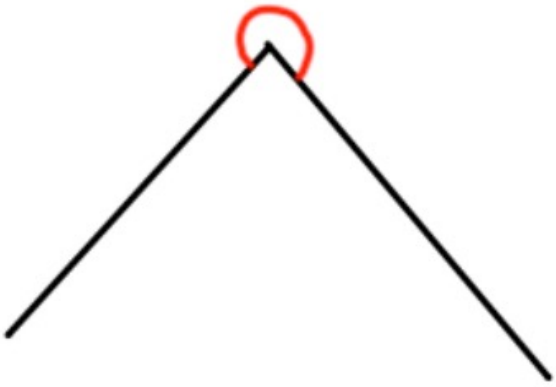
4.3 Measuring Angles

Worked Example	Your Turn
Measure the angles below.	Measure the angles below.







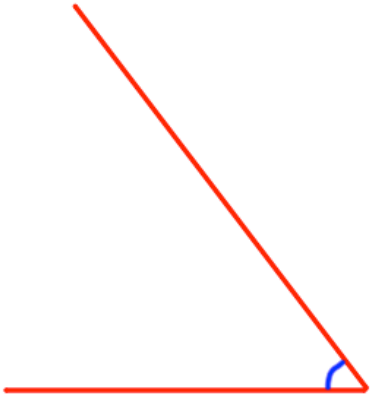


Fluency Practice

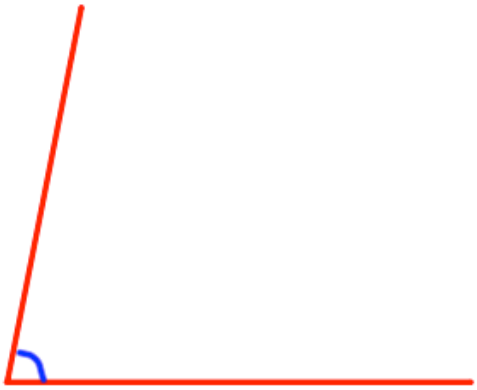
Question 2: Measure each angle below

(a)

(b)



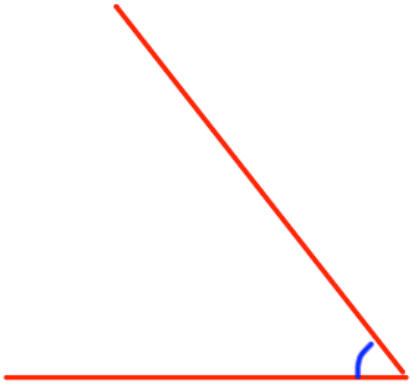
(c)



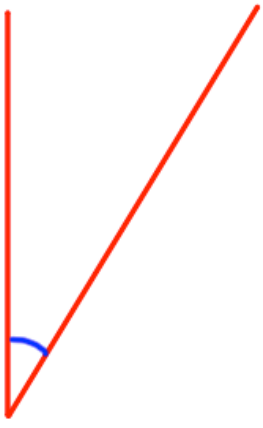
(d)

(e)

(f)



(g)



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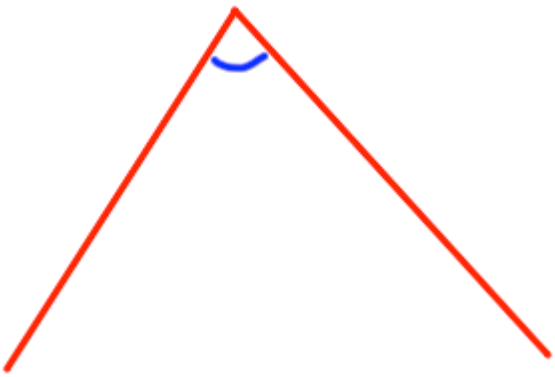
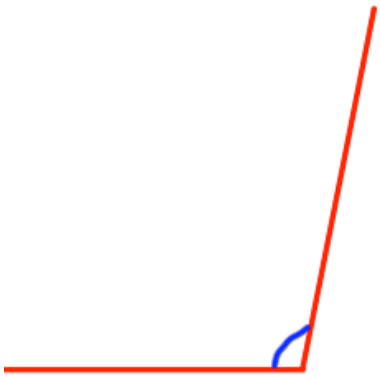


Fluency Practice

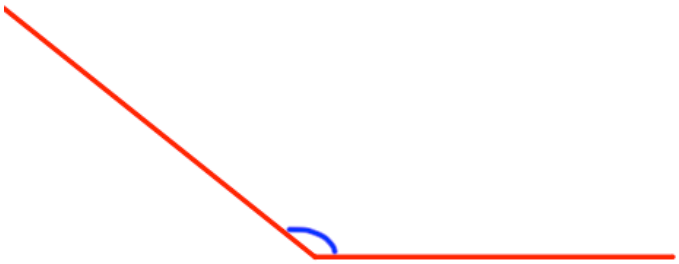
Question 3: Measure each angle below

(a)



(b)

(c)



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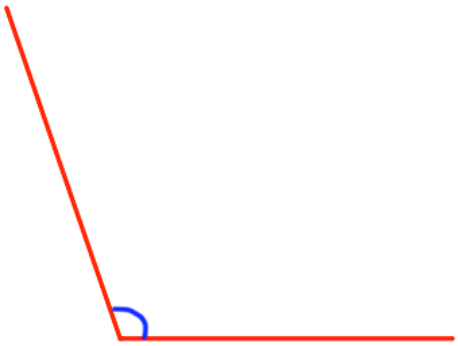

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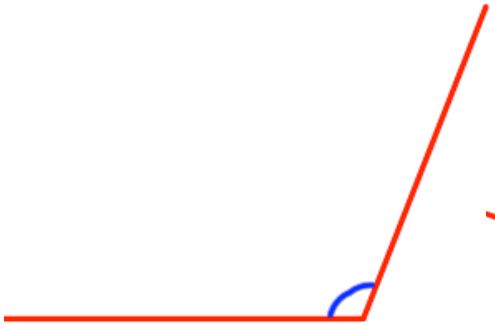

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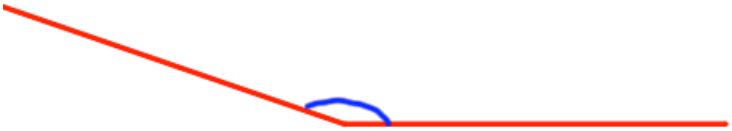

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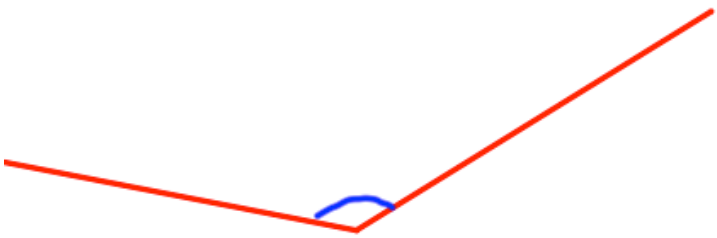
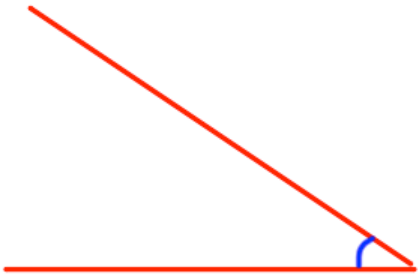


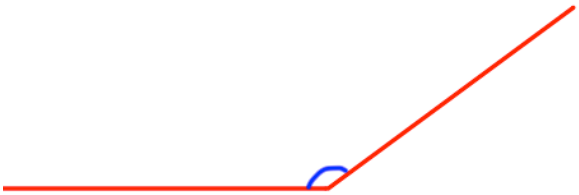
Fluency Practice

Question 4: Measure each angle below

(a)



(b)



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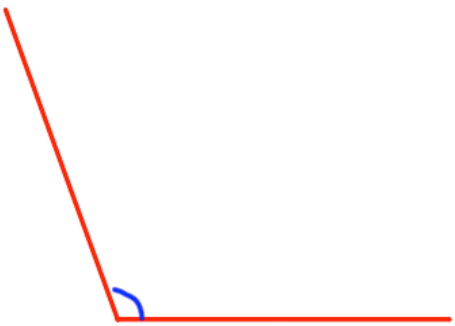

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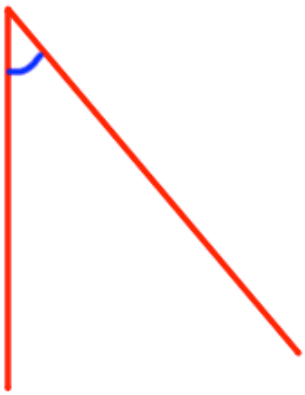
(e)

(f)



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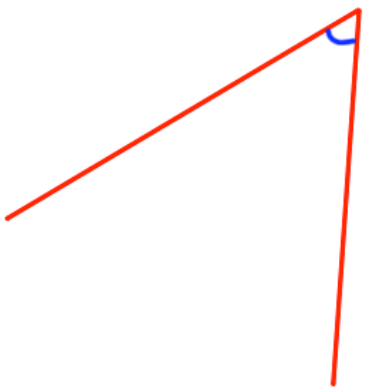


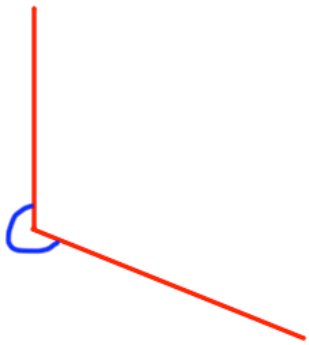
(h)

Fluency Practice

Question 5: Measure each reflex angle below

(a)

(b)



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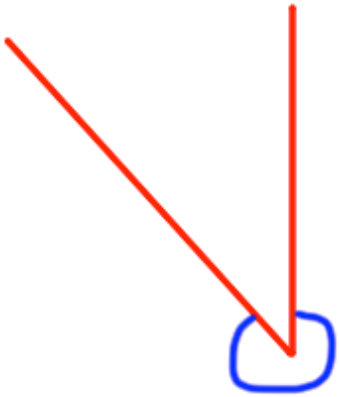
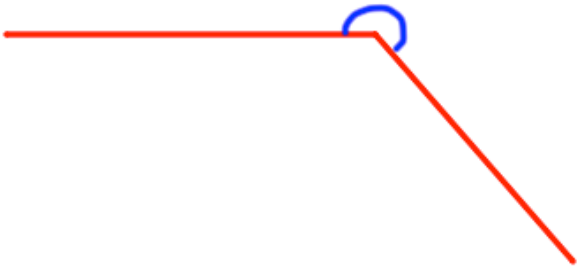


(d)

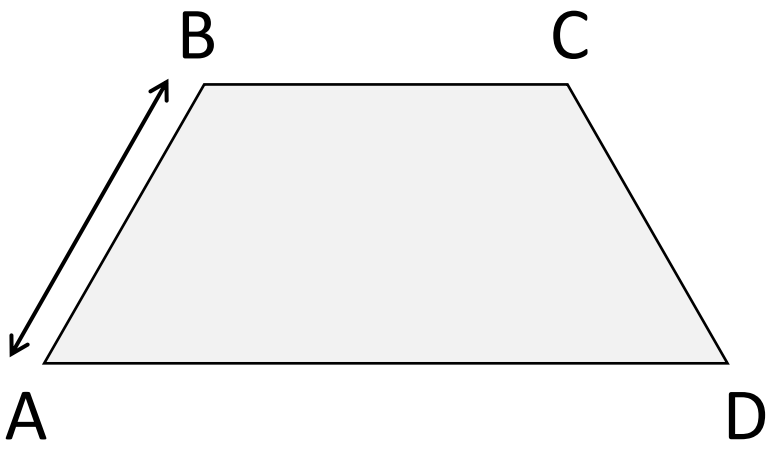


4.4 Drawing Angles

Worked Example	Your Turn
Draw an angle of $70°$	Draw an angle of $80°$
Draw an angle of $215°$	Draw an angle of $225°$

4.5 Notation and Labelling

Labelling Lengths



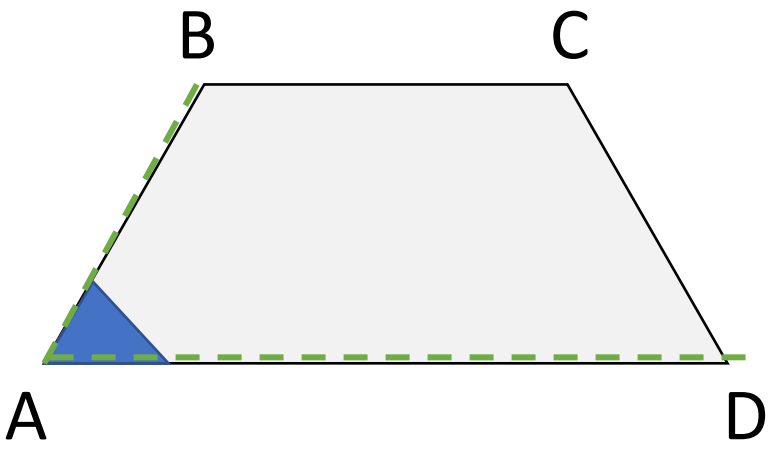
Each point (or corner) of a shape is labelled with a letter.

If we are talking about this distance…

We say we are looking for the length of AB

Because it is the distance between the point labelled A and the point labelled B

Labelling Angles



Each point (or corner) of a shape is labelled with a letter

If we are talking about this angle…

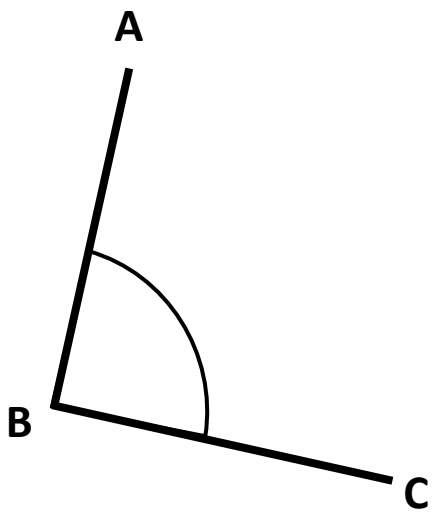
We say we are looking for the angle DAB

Because if we draw a line in order from point D to point A to point B, we draw around the angle

Angle Notation

We can label angles in multiple ways:

$\angle ABC$ *or* $A\hat{B}C$ *or* *Angle* ABC



It can help to see these are instructions rather than labels:

"The turn from line AB to line BC"

We don't need to specify direction yet, so:

$A\hat{B}C = C\hat{B}A$

"The turn from line BC to line AB"

Note: We use capital letter for points.

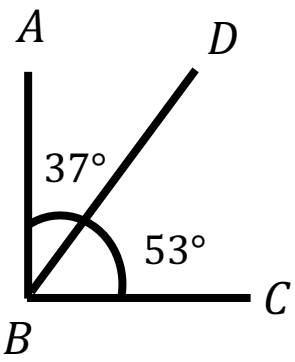
Worked Example

Write down the values of:

$\angle ABD =$

$\angle DBC =$

$\angle ABC =$



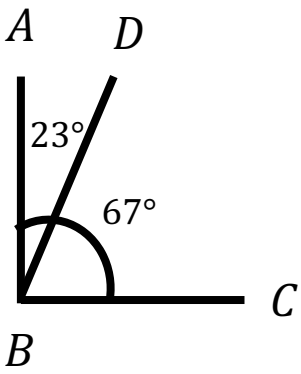
Your Turn

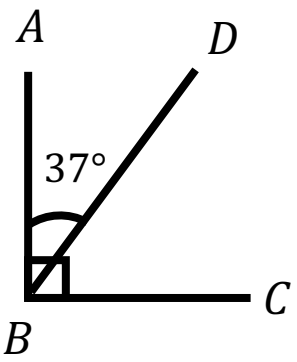
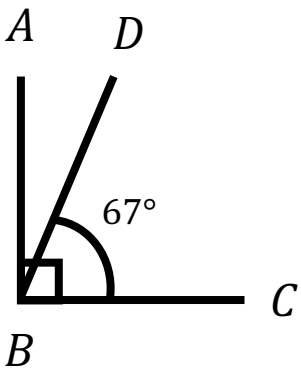
Write down the values of:

$\angle ABD =$

$\angle DBC =$

$\angle ABC =$

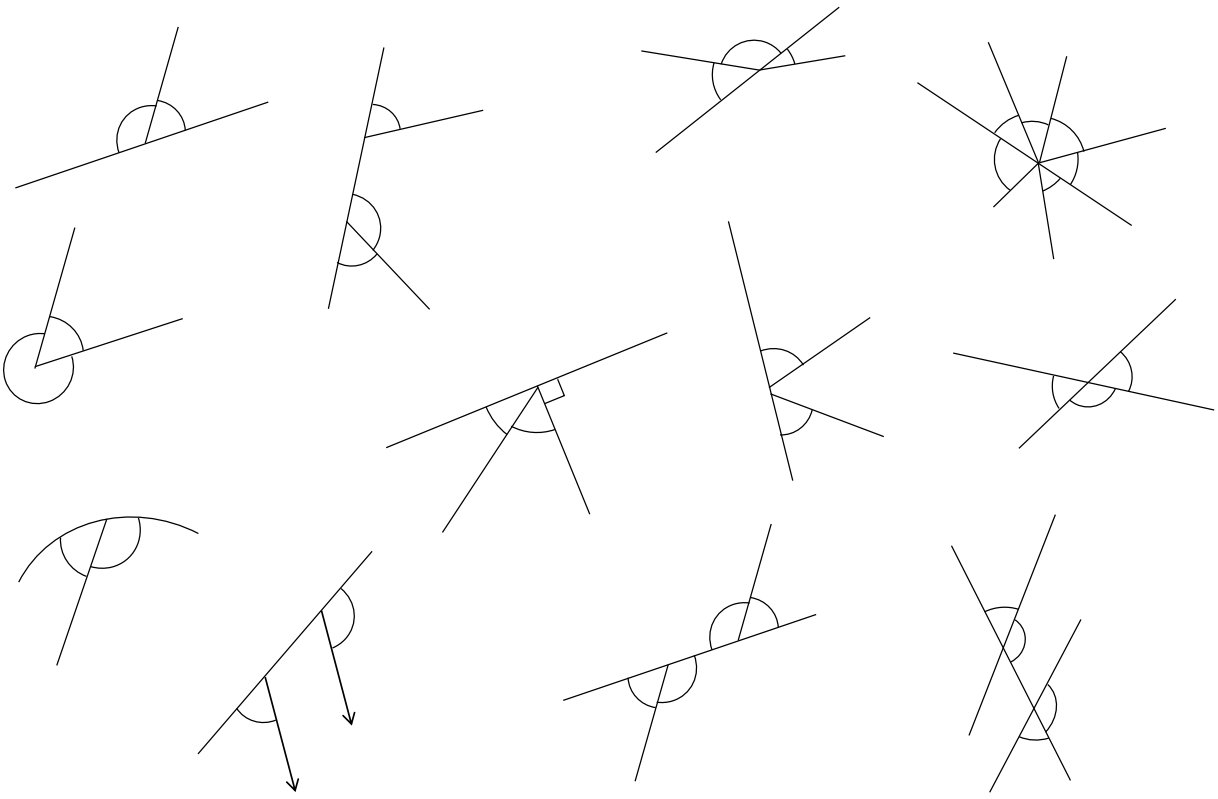


Worked Example	Your Turn
Write down the values of: $\angle ABD =$ $\angle ABC =$ $\angle DBC =$  	Write down the values of: $\angle DBC =$ $\angle ABC =$ $\angle ABD =$ 

4.6 Angles on a Straight Line

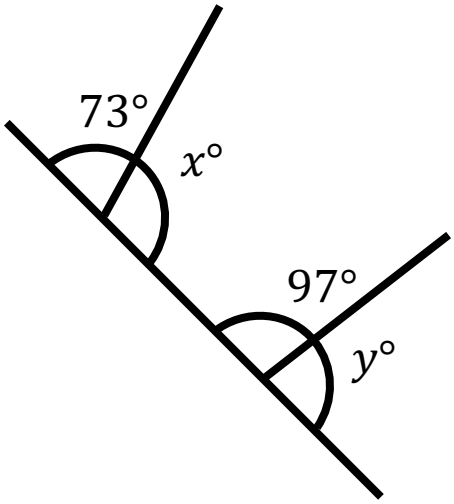
Highlight any angles that would add to 180°

Diagrams not drawn accurately



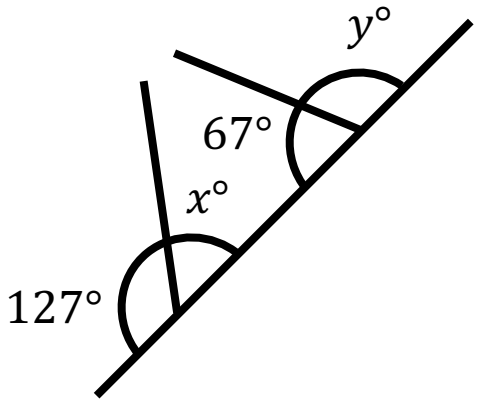
Worked Example

Find the values of x and y



Your Turn

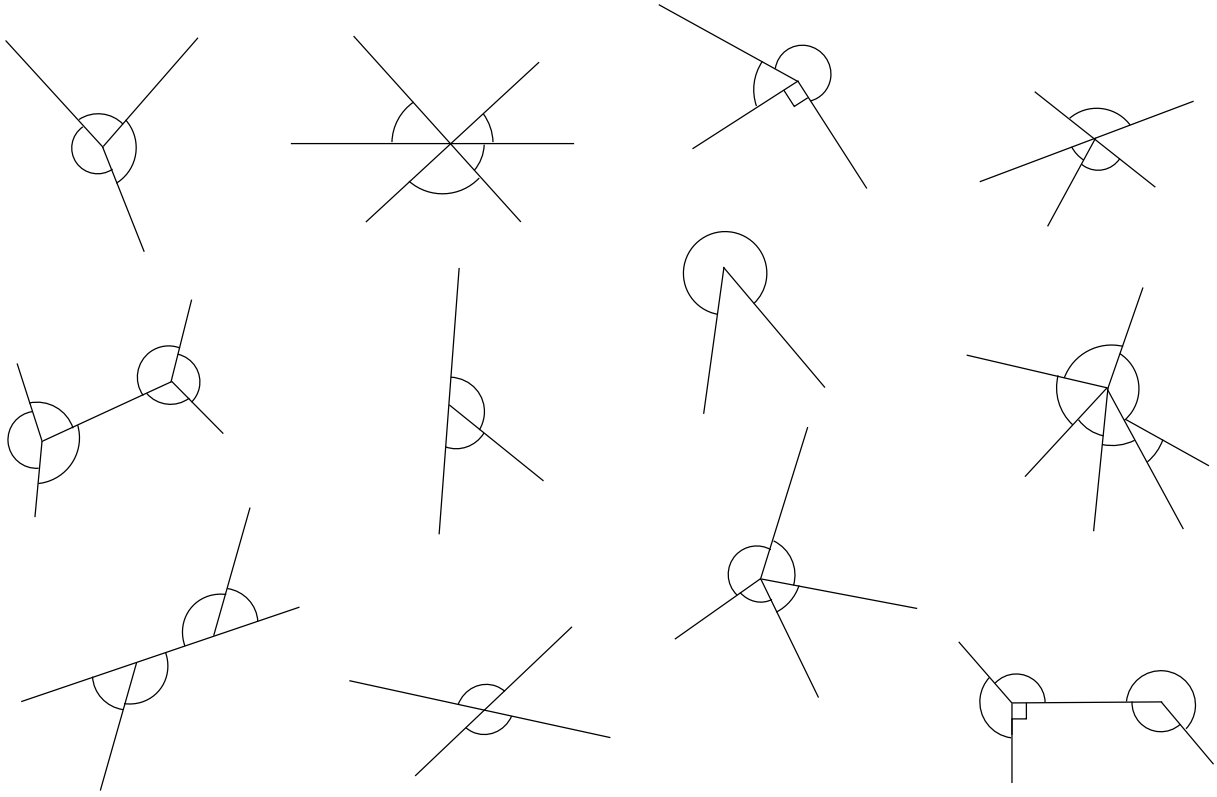
Find the values of x and y



4.7 Angles around a Point

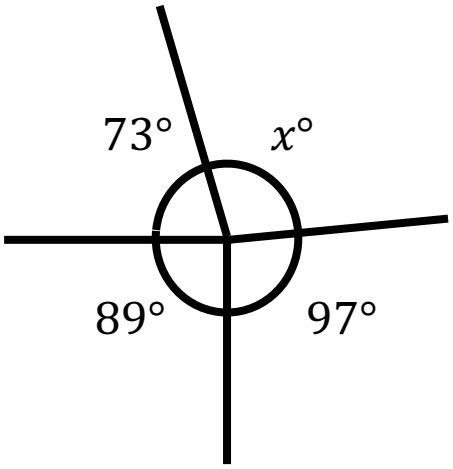
Highlight any angles that would add to 360°

Diagrams not drawn accurately



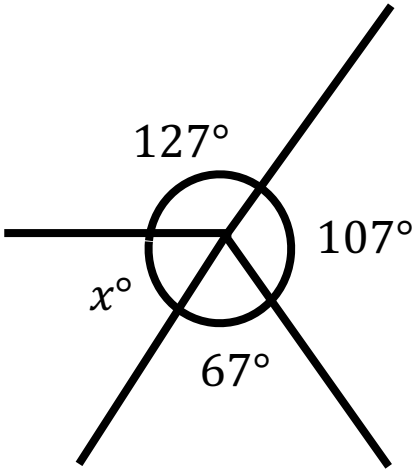
Worked Example

Find the value of x



Your Turn

Find the value of x

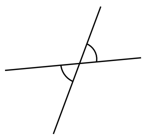


4.8 Vertically Opposite Angles

Vertically opposite means opposite at a vertex.

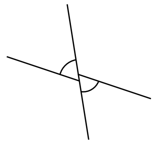
Decide which diagrams show vertically opposite angles

Diagrams not drawn accurately



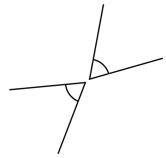
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



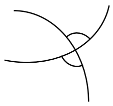
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



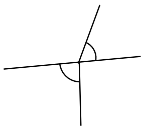
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



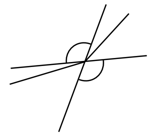
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



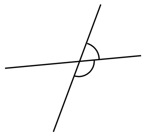
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



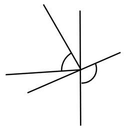
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



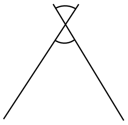
Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason



Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason

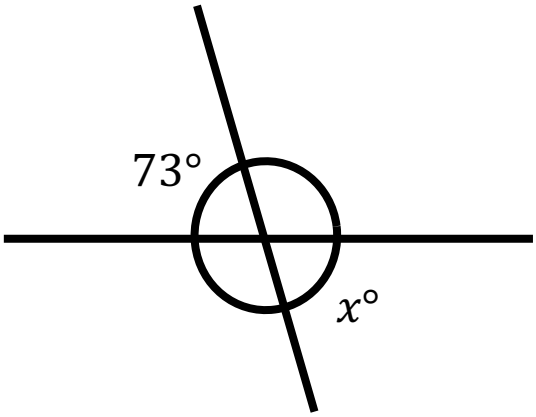


Vertically Opposite	
Not Vertically Opposite	
Cannot Tell	

Explain your reason

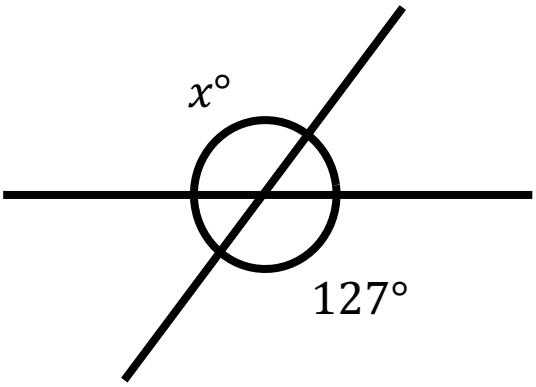
Worked Example

Find the value of x



Your Turn

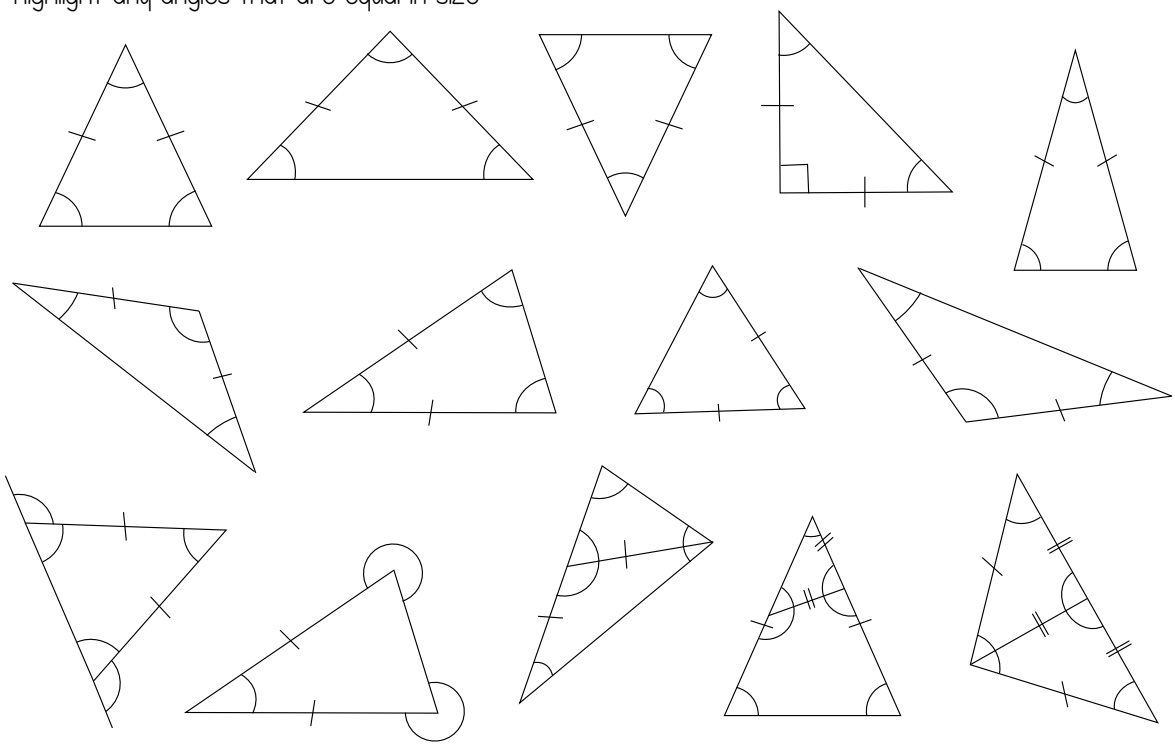
Find the value of x



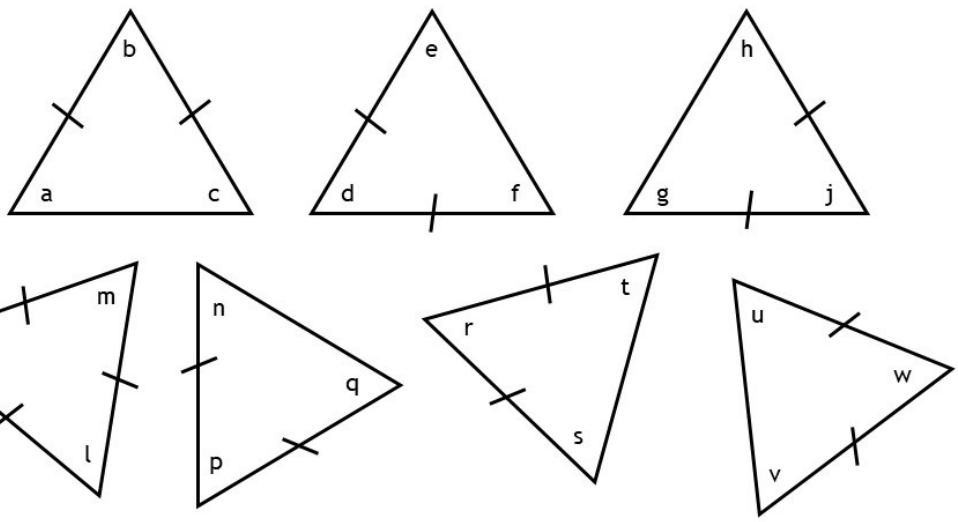
4.9 Angles in Triangles

Highlight any angles that are equal in size

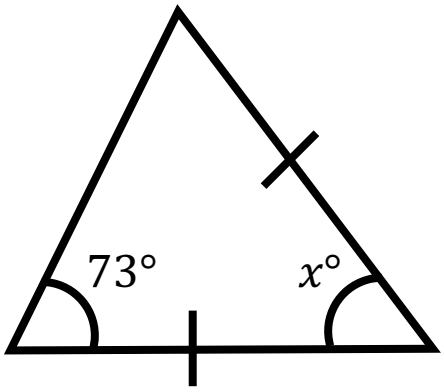
Diagrams are not drawn accurately

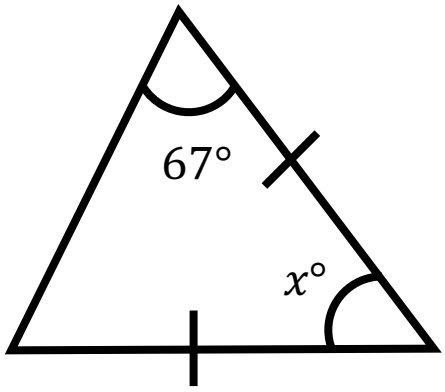


For each triangle, write down the letters of the angles with equal value.

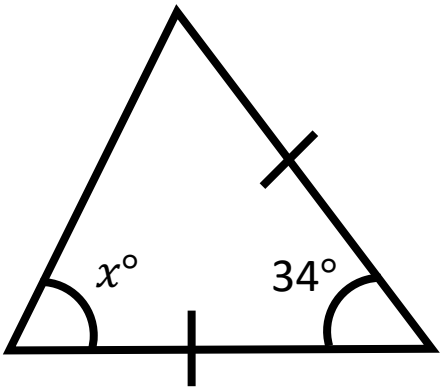


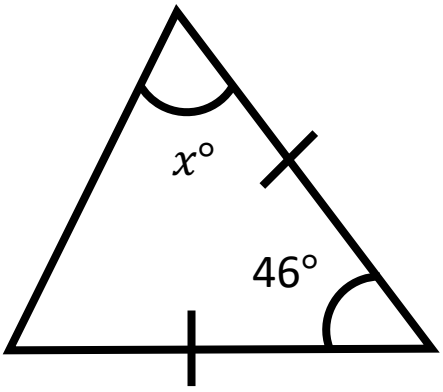
Worked Example	Your Turn
Find the value of x	Find the value of x





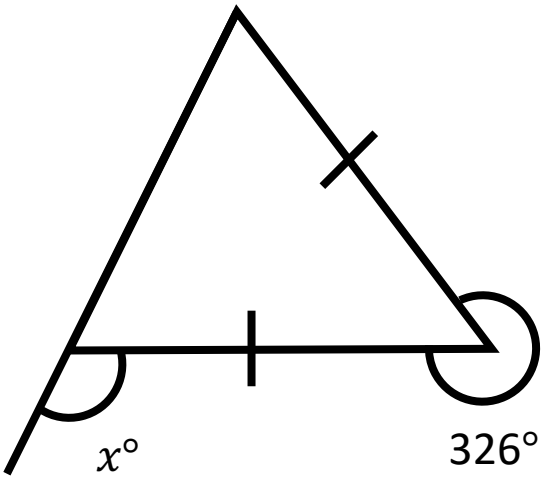
Worked Example	Your Turn
Find the value of x	Find the value of x





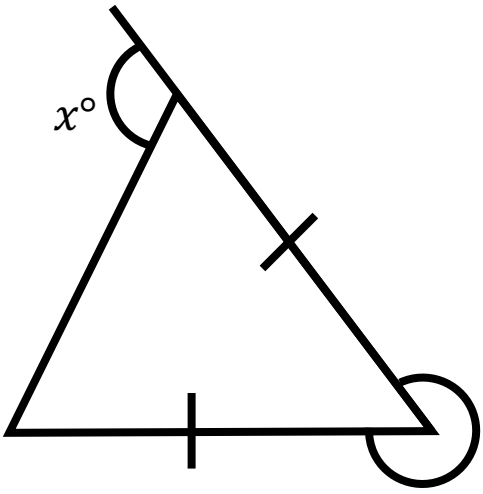
Worked Example

Find the value of x

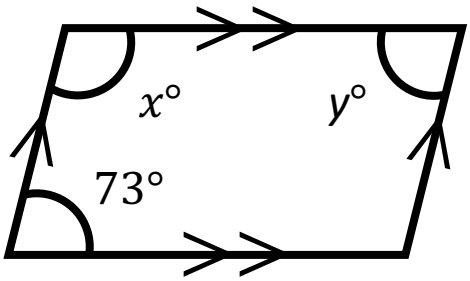
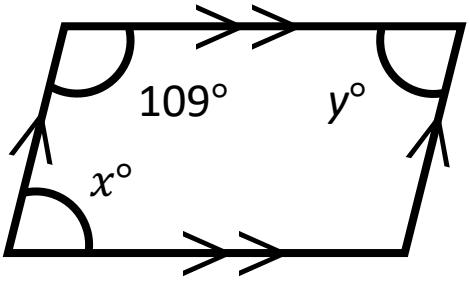


Your Turn

Find the value of x

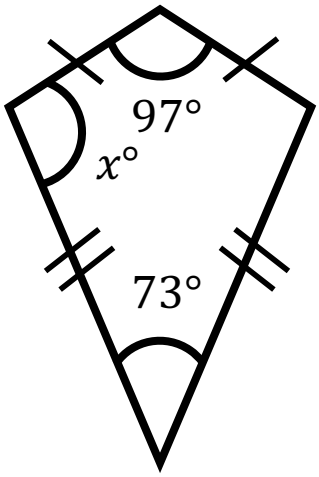


4.10 Angles in Quadrilaterals

Worked Example	Your Turn
Find the values of x and y	Find the values of x and y
	

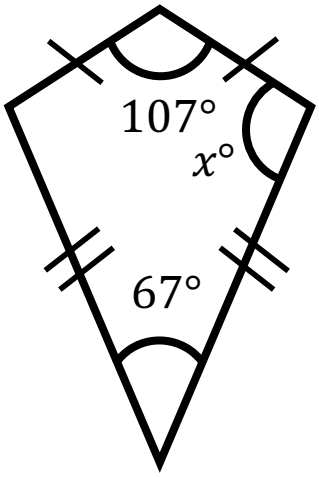
Worked Example

Find the value of x

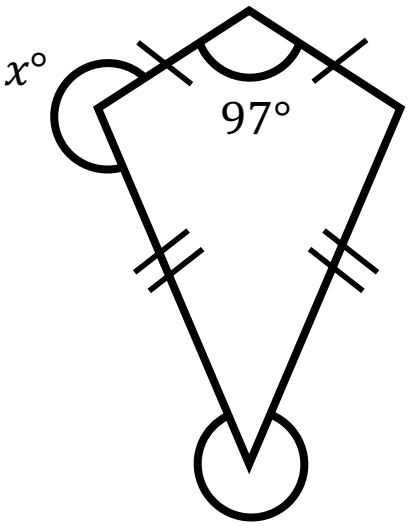


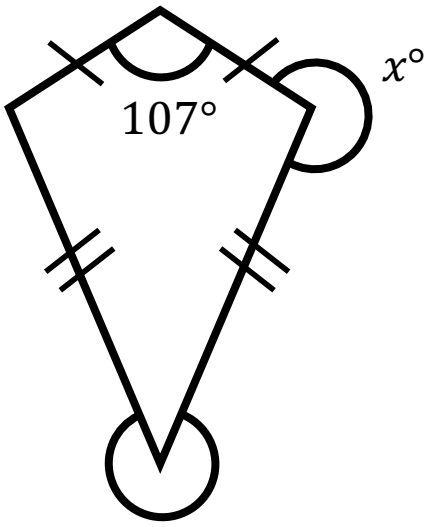
Your Turn

Find the value of x



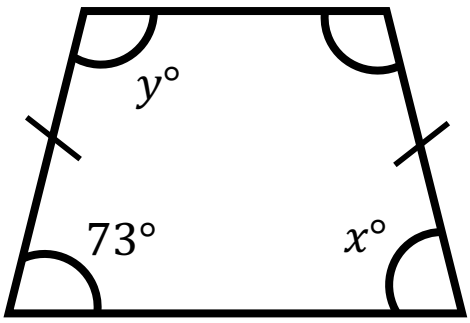
Worked Example	Your Turn
Find the value of x	Find the value of x





Worked Example

Find the values of x and y



Your Turn

Find the values of x and y