

Name: _____

Class: _____

Teacher: _____

Year 10

Higher

Term 3

Homework Booklet

Week 1

1.6 **Starting Six**



What is 35% of £150

Work out $£3.24 \times 17$

Write 150 as a product of prime factors

(a) Write 0.102 as a fraction

(b) Simplify your answer

Solve: $\frac{x}{4} = 3\frac{1}{2}$

Factorise: $15 - 10m$

Solve: $7x - 6 = 5x + 2$

Factorise: $x^2 - 9x + 20$

Week 1

16

Top Ten Topics



Express 245 as a product of prime factors

The pattern shows guests around dining tables:



a) How many guest will be sat around the 35th table in the pattern?

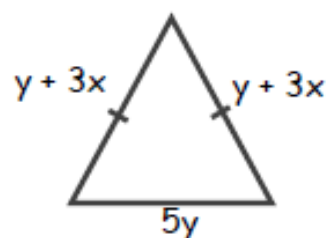
SIMPLIFY:

A) $(3P^2)^3$

B) 9^{-2}

a) Express the perimeter in terms of x and y .

b) If the perimeter is 59cm. Find the value of x when $y = 5$.



Find the Highest Common Factor (HCF) of 28 and 98

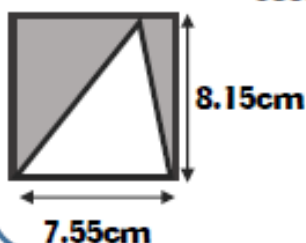
Expand:

a) $(x - 5)(2x - 3)$

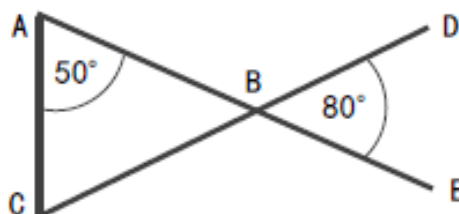
Factorise:

b) $(14y^2 + 21xy)$

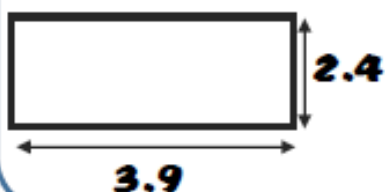
Estimate the area of the shaded section.



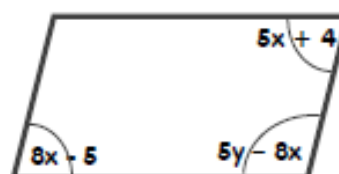
ABE and CBD are straight lines. Show ABC is an isosceles triangle



A tin of paint covers $3m^2$ of flooring and costs £15. Work out how much will need spending to cover the floor.



Find the value of x and y



Week 1

Match the word with its definition

Estimate		Pick the answer from the options given in the question
Select		You will need to work out the answer with or without a calculator
Write		From smallest to largest
Ascending		Don't work out an exact answer. Round the numbers to 1sf before doing the calculation
Calculate		No working out required

Spot the Mistake

<p>Question 1: Simplify fully: $\frac{12abc^2}{18bc}$</p>	
<i>Carol's answer:</i>	<i>Your answer:</i>
<p>Look for common factors in the numerator and denominator. Answer: $\frac{6ac}{9}$</p>	
<p><i>What mistake has Carol made?</i></p>	
<p>Question 2: Write the following as a single fraction: $\frac{x}{3} + \frac{x}{9}$</p>	
<i>Carol's answer:</i>	<i>Your answer:</i>
<p>Add the two fractions: $\frac{2x}{12}$ Answer: $\frac{x}{6}$</p>	
<p><i>What mistake has Carol made?</i></p>	

Week 2

0.9 **Starting Six**



Find 65% of £320

Work out 3.6×2.1

Write 27 as a product of prime factors

Write 0.031 as a fraction

Solve: $6b - 2 = 22$

Simplify: $f + 4f - 2f$

Solve: $7k - 5 = 3k + 11$

Simplify: $5b + 2a - 3 - 2b + a + 5$

Score ____ / 6

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Week 2

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Top Ten Topics



Express 255 as a product of prime factors

The pattern shows guests around dining tables:



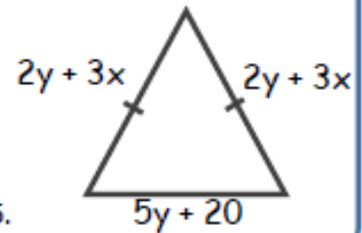
a) Which pattern number will have 100 guests sat around it?

SIMPLIFY:

A) $(2F^2)^5$

B) 5^{-8}

a) Express the perimeter in terms of x and y .



b) If the perimeter is 68cm. Find the value of y when $x = 5$.

Find the Highest Common Factor (HCF) of 39 and β !

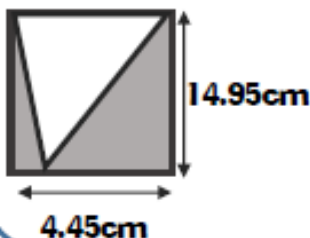
Expand:

a) $(x + 5)(2x - 3)$

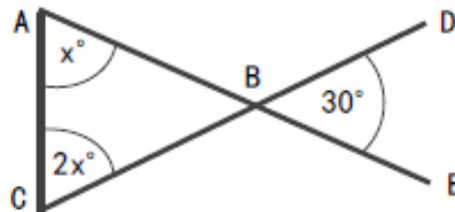
Factorise:

b) $(16x^2 - 24xy)$

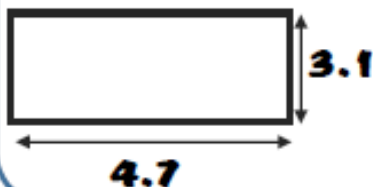
Estimate the area of the shaded section.



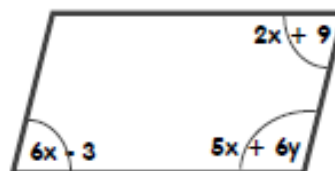
ABE and CBD are straight lines. Prove that one angle in ABC is obtuse.



A tin of paint covers $3m^2$ of flooring and costs £20. Work out how much will need spending to cover the floor.



Find the value of x and y



Week 2

Match the word with its definition

Show		Largest to smallest
Construct		The same as
Solve		Use words, numbers or algebra to show something
Descending		Use a pencil, ruler and/or compasses
Equivalent		Find the value of 'x' that makes the equation true

Spot the Mistake

Question 3:

Write

$$\frac{5x^2y^3}{15xy^5}$$

in the form $kx^m y^n$ where k , m and n are constants to be found.

Carol's answer:

Simplify:

$$\frac{x}{3y^2}$$

Answer:

$$3xy^{-2}$$

$$k = 3, m = 1, n = -2$$

Your answer:

What mistake has Carol made?

Week 3

1.0 **Starting Six**



Find 85% of £620

Work out 0.56×7

Write 36 as a product of prime factors

Write 0.103 as a fraction

Solve: $5m - 3 = 22$

Simplify: $3f - 5f + 7f$

Solve: $8x - 5 = 3x + 10$

Simplify: $5p + 4 + 3p - 6$

Score ___ / 6

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Top Ten Topics



Express 198 as a product of prime factors

The pattern shows a sequence made from bricks:



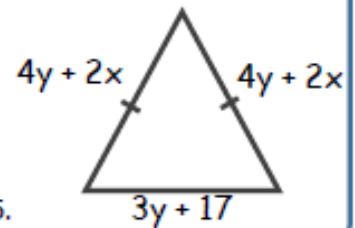
a) Which pattern number will have 77 bricks?

SIMPLIFY:

A) $(4p^4)^2$

B) 2^{-4}

a) Express the perimeter in terms of x and y .



b) If the perimeter is 68cm. Find the value of y when $x = 5$.

Find the Highest Common Factor (HCF) of 35 and 91

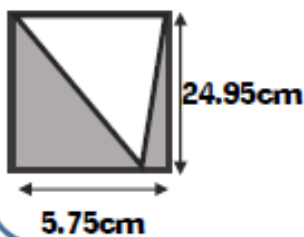
Expand:

a) $(2x + 4)(2x + 5)$

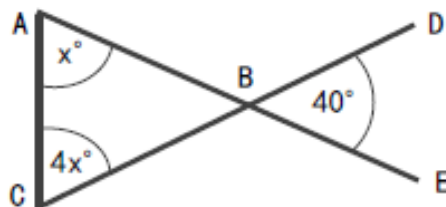
Factorise:

b) $x^2 + 8x + 15$

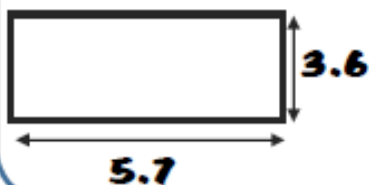
Estimate the area of the shaded section.



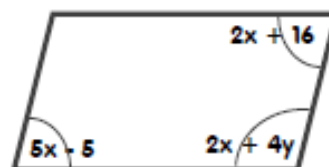
ABE and CBD are straight lines. Prove that one angle in ABC is obtuse.



A tin of paint covers $4m^2$ of flooring and costs £18. Work out how much will need spending to cover the floor.



Find the value of x and y



Week 3

Match the word with its definition

Simplify		Find a value of
Expand		Measuring will not get you any marks
Factorise fully		Put into brackets removing more than one factor
Evaluate		Collect like terms in an algebraic expression or cancelling a fraction or ratio
Not to scale		Multiply everything inside the brackets by what's in front of it

Spot the Mistake

Question :

Write the following as a single fraction:

$$\frac{x + 4}{3} - \frac{2x - 3}{5}$$

Carol's answer:

Put over a common denominator:

$$\frac{5(x + 4) - 3(2x - 3)}{15}$$

15

Expand brackets:

$$\frac{5x + 20 - 6x - 9}{15}$$

15

Answer:

$$\frac{11 - x}{15}$$

15

Your answer:

What mistake has Carol made?

Week 4

1.1 **Starting Six**



Find 95% of £240

Work out 0.35×8

Write 180 as a product of prime factors

Write 0.205 as a fraction

Solve: $4m + 6 = 18$

Simplify: $5p + 4m + 3p - 6m$

Solve: $7x - 4 = 4x + 8$

Factorise: $15 - 20x$

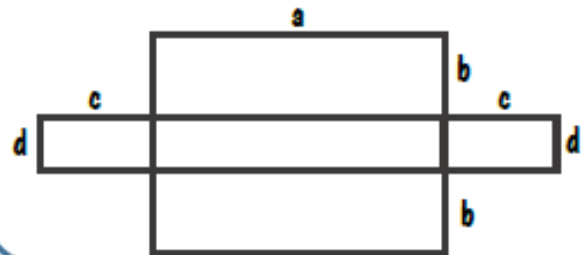
Score ____ / 6

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Four numbers have a median of 6, a mean of 7 and a range of 8. What could they be?

Shade an area represented by the expression ab



JON HAS 76P
 NAT HAS €3.52
 NAT GIVES JON SOME MONEY SO THAT THEY
 BOTH HAVE THE SAME AMOUNT.
 HOW MUCH DOES NAT GIVE JON?

Write the number of left handed girls to right handed girls as a ratio in its simplest form.

	Boys	Girls
Left	3	8
Right	12	20

AB is a straight line. Work out the size of angle x .



Expand:

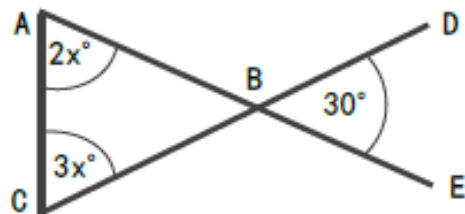
a) $(3x + 2)(x + 2)$

Factorise:

b) $x^2 + 9x + 14$

The amount of red beads to blue beads on a necklace are in the ratio 3:12. What is the percentage of red beads?

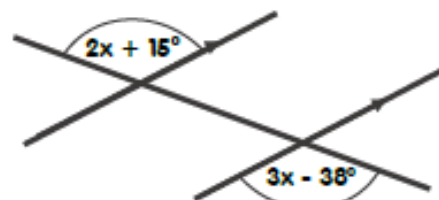
ABE and CBD are straight lines. Prove that one angle in ABC is not acute.



A drink is mixed in the ratio
 lemonade : orange : cranberry = 6:3:2
 What fraction is orange?

Three straight lines are shown. Work out the value of x

$\frac{3}{8}$ $\frac{2}{11}$ $\frac{3}{11}$ $\frac{6}{11}$



Week 4

Match the word with its definition

Use the graph		Use the answer you have already been asked to find
Factorise		You will need to do a calculation with or without a calculator
Explain		Do not calculate. Read the answer from the graph
Hence		Take out a common factor. Your answer may be in one or two brackets
Calculate		Use sentences and check they make sense

Spot the mistake

Question 1:	
Simplify fully $\sqrt{80}$.	
<i>Diane's answer:</i>	<i>Your answer:</i>
$\sqrt{80} = \sqrt{4 \times 20}$ $\sqrt{80} = \sqrt{4} \times \sqrt{20}$ Answer: $2\sqrt{20}$	
What mistake has Diane made?	
Question 2:	
Evaluate $\sqrt{12} \times \sqrt{3}$.	
<i>Diane's answer:</i>	<i>Your answer:</i>
Combine under one square root: $\sqrt{12} \times \sqrt{3} = \sqrt{36}$ Answer: $\sqrt{36}$	
What mistake has Diane made?	

Week 5

1.2 **Starting Six**



What is 35% of £150

Work out 0.35×3.7

Write 360 as a product of prime factors

Write 0.108 as a fraction

Solve: $6 + 4m = 22$

Simplify: $2f + 3f - f$

Solve: $5x + 4 = 8x - 2$

Factorise: $24 - 18m$

Score ____ / 6

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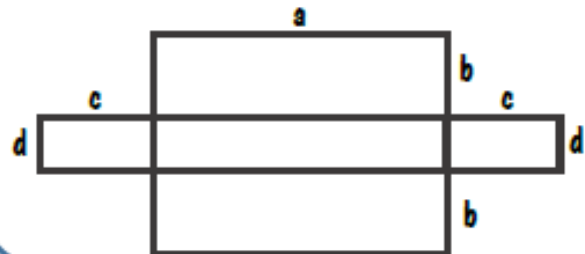
20

Top Ten Topics



Four numbers have a median of 7, a mean of 8 and a range of 8. What could they be?

Shade an area represented by the expression ad



FRED HAS £1.46

AMI HAS £3.42

FRED GIVES AMI SOME MONEY SO THAT THEY BOTH HAVE THE SAME AMOUNT.

HOW MUCH DOES FRED GIVE AMI?

Write the number of left handed boys to right handed boys as a ratio in its simplest form.

	Boys	Girls
Left	9	5
Right	15	20

AB is a straight line. Work out the size of angle x .



Expand:

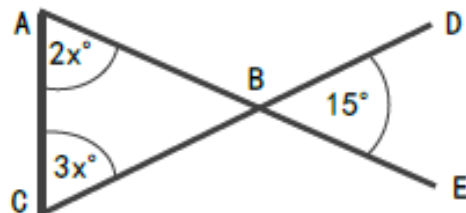
a) $(2x + 2)(x - 2)$

Factorise:

b) $x^2 + 10x + 21$

The amount of white beads to black beads on a necklace are in the ratio 7:21. What is the percentage of white beads?

ABE and CBD are straight lines. Prove that one angle in ABC is not acute.

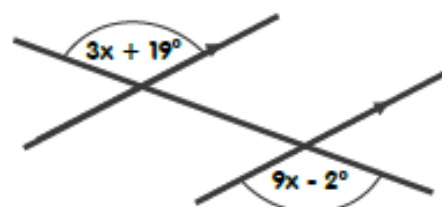


A drink is mixed in the ratio water : apple juice : pear juice = 3:7:4

What fraction is apple juice?

- $\frac{7}{10}$ $\frac{1}{2}$ $\frac{3}{14}$ $\frac{4}{14}$

Three straight lines are shown. Work out the value of x



Week 5

Match the word with its definition

Estimate		Find the values of 'x' that make the equation true
Work out		Use a pencil and ruler and draw in the correct positions/height
Plot		Written calculations are expected
Solve		Use a ruler or protractor and be as accurate as you can
Measure		Don't work an exact answer. Round the numbers before doing the calculation

Spot the mistake

Question 1:	
Simplify fully $\sqrt{200}$	
<i>Diane's answer:</i>	<i>Your answer:</i>
$\sqrt{200} = \sqrt{2 \times 100}$ $\sqrt{200} = \sqrt{2} \times \sqrt{100}$ Answer: $2\sqrt{10}$	
<i>What mistake has Diane made?</i>	
Question 2:	
Simplify fully $\sqrt{27} + \sqrt{75}$	
<i>Diane's answer:</i>	<i>Your answer:</i>
Simplify both separately: $\sqrt{27} = 3\sqrt{3}$ $\sqrt{75} = 3\sqrt{5}$ Answer: $3\sqrt{3} + 3\sqrt{5}$	
<i>What mistake has Diane made?</i>	

Week 6

1.3 **Starting Six**



What is 35% of £250

Work out 2.6×3.5

Write 250 as a product of prime factors

Write 0.056 as a fraction

Solve: $3f + 2f - f = 20$

Factorise: $24 - 18m$

Solve: $7x - 3 = 5x + 3$

Factorise: $x^2 + 7x + 12$

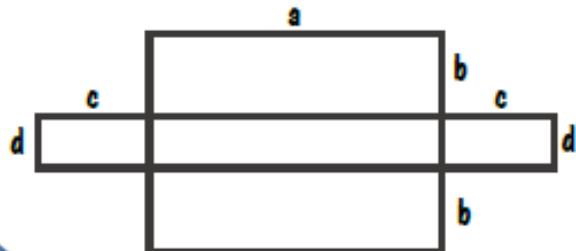
Score ____ / 6

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Four numbers have a median of 6, a mean of 6 and a range of 6. What could they be?

Shade an area represented by the expression: $2cd$



IN A COMPANY, THE RATIO OF THE NUMBER OF MEN TO THE NUMBER OF WOMEN IS 3 : 2

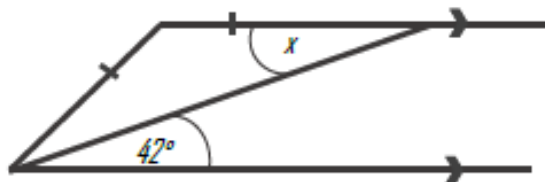
10% OF THE WOMEN ARE UNDER THE AGE OF 25

IF THERE ARE 100 WORKERS, HOW MANY WOMEN IN THE COMPANY ARE UNDER THE AGE OF 25?

Write the number of left handed boys as a percentage of the total students.

	Boys	Girls
Left	9	5
Right	16	20

AB and CD are parallel. Work out the size of angle x .



Expand:

a) $(2x - 3)(2x - 5)$

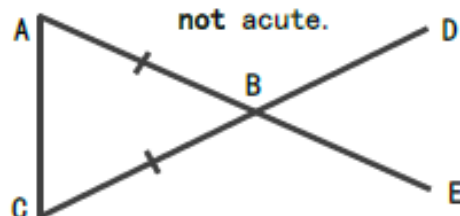
Factorise:

b) $x^2 - 4x - 21$

There are only black pens and green pens in a box. The ratio of the number of black pens in the box to the number of green pens in the box is 3 : 2

What percentage of the pens are black?

The angles in triangle ABC are in the ratio 2:2:6. Prove that angle ABC is not acute.

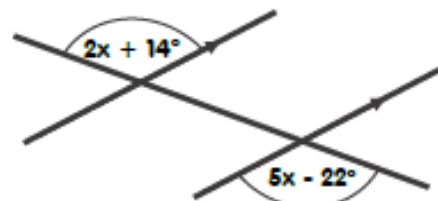


A drink is mixed in the ratio raspberry : orange : sugar syrup = 2:5:3

What fraction is orange?

- $\frac{2}{10}$ $\frac{1}{2}$ $\frac{3}{10}$ $\frac{5}{9}$

Three straight lines are shown. Work out the value of x



Week 6

Match the word with its definition

Compare		Use sentences and check they make sense
Descending		From smallest to largest
Give the units		Calculate or find two or more items and write a sentence stating the differences
Explain		From largest to smallest
Ascending		Make sure you write down the correct units for length, area, volume, etc

Spot the mistake

Question 1:	
Simplify fully $\sqrt{98} - \sqrt{50}$	
<i>Diane's answer:</i>	<i>Your answer:</i>
Simplify both separately: $\sqrt{98} = 7\sqrt{2}$ $\sqrt{50} = 5\sqrt{2}$ Subtract: $7\sqrt{2} - 5\sqrt{2}$ Answer: 2	
<i>What mistake has Diane made?</i>	
Question 2:	
Factorise fully $8a^2b - 12ab^2$	
<i>Lucy's answer:</i>	<i>Your answer:</i>
$8a^2b - 12ab^2$ Answer: $4a^2b(2 - 3b)$	
<i>What mistake has Lucy made?</i>	