



Simplifying and factorising

About 45 minutes No calculator 39 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks] **A2** From chapter 3 [2 marks]
- A rectangle has length $(7x + 3)$ cm and width $(3x - 7)$ cm. Write an expression, in its simplest form, for its perimeter.
- The values 6, 7, 8 have frequencies 8, x , 2. The mean is 6.5. Find x .

Answer

Answer

- A3** From chapter 6 [2 marks] **A4** Last lesson [2 marks]
- The angles of a hexagon are $2x^\circ$, $3x^\circ$, 135° , 120° , 120° and 170° . Find x .
- Points A and B are 72 cm apart. Point P is 39 cm from A and 39 cm from B . How far is P from the line AB ?

Answer

Answer

B Example, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Work out the value of $2x^2 - 5x$ when $x = -3$.**Hint** Square first, then multiply. Two negatives multiplied make a positive.

- B1** Work out the value of $4y^2 - 3y$ [2 marks] when $y = -2$.

Answer

EXAMPLE 2

Factorise fully $12p^2q - 20pq$.**Hint** Find the HCF of the numbers, then the letters every term shares.

- B2** Factorise fully $14m^2n + 21mn^2$. [2 marks]

Answer

C Practice

C1 Simplify $6a - 2b + 3 - 4a - 5b$. [2 marks]

Answer

C2 Work out the value of $\frac{p^2 + q}{3}$ [2 marks]
when $p = -5$ and $q = -1$.

Answer

C3 Factorise fully $8x^2 - 12x$. [2 marks]

Answer

C4 Is $2(x + 6) = 2x + 6$ an identity? [2 marks]
Give a reason.

C5 Write whether each is an [2 marks]
expression, an equation, a
formula or an identity.

(a) $v = u + at$

(b) $3x + 4 = 19$

(c) $5(x + 2) \equiv 5x + 10$

(d) $4x^2 - 7$

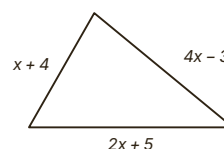
C6 Simplify $\frac{4a^2b \times 6ab^3}{8a^2b}$. [2 marks]

Answer

C7 Expand and simplify [2 marks]
 $4(3x - 2) - 3(2x - 5)$.

Answer

C8 The sides of a triangle are [2 marks]
 $(2x + 5)$ cm, $(4x - 3)$ cm and
 $(x + 4)$ cm. Write an expression,
as simply as possible, for its
perimeter.



Answer cm

D Exam-style questions

D1 Ria says, "When $x = -3$, $5x^2 = 225$." [2 marks]

Explain why Ria is wrong, and give the correct value.

D2 Pens cost p pence each and pencils cost q pence each. Amy buys 5 pens and 3 pencils. Ben buys 2 pens and 7 pencils.

- (a) Write an expression, as simply as possible, for the total that Amy and Ben pay together. [2 marks]

Answer

- (b) A pen costs 45p and a pencil costs 20p. Work out the total they pay together. [2 marks]
Give your answer in pounds.

Answer

- (c) Write an expression, as simply as possible, for how much more Amy pays than Ben. [2 marks]

Answer

Total for D2: 6 marks

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** x and y are positive whole numbers and $3xy + 6x = 42$. Find every possible pair of values of x and y . [3 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Factorise the left-hand side.
Hint 2 $3x(y + 2) = 42$, so $x(y + 2) = 14$.
Hint 3 $y + 2 \geq 3$, so $x = 1, y + 2 = 14$ or $x = 2, y + 2 = 7$. So $x = 1, y = 12$ or $x = 2, y = 5$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can substitute negative values into an expression. ☐ ☐ ☐

I can collect like terms and tell an identity from an equation. ☐ ☐ ☐

I can factorise fully by taking out the highest common factor. ☐ ☐ ☐