



Like terms

Year 7 About 60 minutes No calculator 50 marks

Date _____

A Do Now

Quick questions to start.

A1 Needed today [1 mark]

Work out $3 - 8 + 2$.

Answer

A2 Last lesson [1 mark]

Write $5 \times a \times b \times a$ as simply as possible.

Answer

A3 From chapter 4 [1 mark]

Work out 15% of 80.

Answer

A4 From chapter 1 [1 mark]

Write down the highest common factor of 28 and 42.

Answer

B Example, then your turn

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

EXAMPLE 1

Simplify each expression.

(a) $9k + 4k - k$

(b) $3p - 8p + 2p$

(c) $-5ab - 2ab + 9ab$

Hint Like terms have exactly the same letters. Add and subtract the numbers in front, keeping each sign with its term.

B1 Simplify each expression. [3 marks]

(a) $6t + 11t - 3t$

(b) $4w - 9w - w$

(c) $-3xy + 8xy - 2xy$

Answer (a) (b) (c)

EXAMPLE 2

Simplify each expression.

(a) $5a - 2ab + a + 6ab$

(b) $3x^2 + 7x - x^2 - 9x + 4$

Hint Put like terms next to each other first. a and ab are not like terms; x^2 and x are not like terms.

B2 Simplify each expression. [2 marks]

(a) $8m + 3mn - 5m - 7mn$

(b) $4y^2 - 3y + 2y^2 + y - 6$

Answer (a) (b)

EXAMPLE 3

Simplify each expression.

(a) $3x - \frac{x}{2}$ (b) $2.6n - 0.9n$

Hint $\frac{x}{2}$ is the same as $\frac{1}{2}x$. Write $3x$ as $\frac{6}{2}x$.

B3 Simplify each expression. [3 marks]

(a) $5y - \frac{3y}{4}$

(b) $4.2t - 1.5t$

(c) $\frac{w}{5} + \frac{3w}{5}$

Answer (a) (b) (c)

EXAMPLE 4

$2n$, $2n + 2$ and $2n + 4$ are three even numbers in a row.

(a) Write them down when $n = 7$.

(b) Write and simplify their sum.

(c) Explain why the sum is always a multiple of 6.

Hint For (c), look at your expression: can every term be divided by 6?

B4 n , $n + 1$, $n + 2$ and $n + 3$ are four whole numbers in a row. [3 marks]

(a) Write them down when $n = 19$.

(b) Write and simplify their sum.

(c) Explain why the sum is always even.

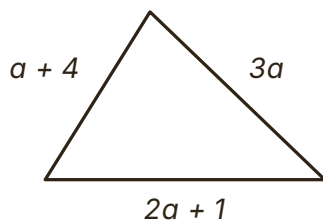
(c) Explain why the sum is always even.

EXAMPLE 5

The side lengths of this triangle are in centimetres.

(a) Write and simplify an expression for the perimeter.

(b) Work out the perimeter when $a = 3$.



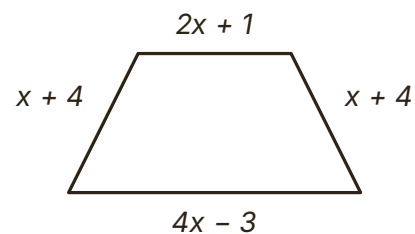
Not drawn accurately

Hint Add all three sides. Collect the a terms, then the numbers.

B5 The side lengths of this trapezium are in centimetres. [3 marks]

(a) Write and simplify an expression for the perimeter.

(b) Work out the perimeter when $x = 3$.



Not drawn accurately

Answer (a) cm (b) cm

C Practice

Year 7

C1 Two of these expressions can be simplified and one cannot. Say which one cannot. Simplify the other two. [3 marks]

A $3ab + 2a - b + 4$

B $5m + 2mn - 3m$

C $x^2 + 4x - x^2$

C2 Write down the missing term. [1 mark]

$$4p + 3q + \boxed{} - q = 9p + 2q$$

Answer

C3 Simplify $4x^2 - \frac{x^2}{3}$. [2 marks]

Answer

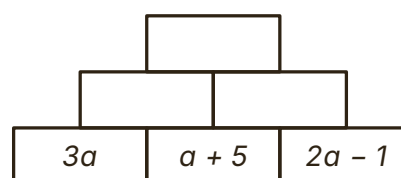
C4 Simplify $2 + 5x - x^2 - 7 - 5x + 3x^2$. [2 marks]

Answer

C5 Simplify $\frac{9}{k} + \frac{6}{k} - \frac{2}{k}$. [1 mark]

Answer

C6 In this pyramid, each brick is the sum of the two bricks below it. Complete the pyramid. Simplify each expression. [3 marks]

**D Exam-style questions**

GCSE Foundation

D1 Tom says, " $5x + 3y$ simplifies to $8xy$." [2 marks]

Tom is wrong. Explain why.

D2 Simplify fully

(a) $7m - 2m + m$

[1 mark]

Answer

(b) $4a + 3b - a + 2b$

[2 marks]

Answer

(c) $6x^2 + 2x - x^2 - 5x$

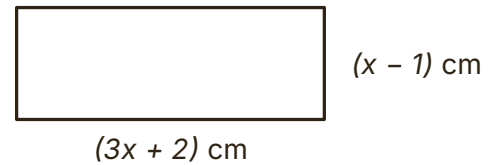
[2 marks]

Answer

Total for D2: 5 marks

D3 Here is a rectangle.

- (a) Show that the perimeter of the rectangle is $(8x + 2)$ cm. [2 marks]



Not drawn accurately

- (b) The perimeter of the rectangle is 50 cm. Work out the value of x . [2 marks]

Answer

- (c) Work out the length of the longer side of the rectangle. [1 mark]

Answer

Total for D3: 5 marks

D4 A pen costs x pence and a pencil costs y pence. Ann buys 4 pens and 3 pencils. Ben buys 2 pens and 5 pencils.

- (a) Write an expression, in pence, for the total amount Ann and Ben spend together. Simplify your answer. [2 marks]

Answer

- (b) Write an expression, in pence, for how much more Ann spends than Ben. Simplify your answer. [2 marks]

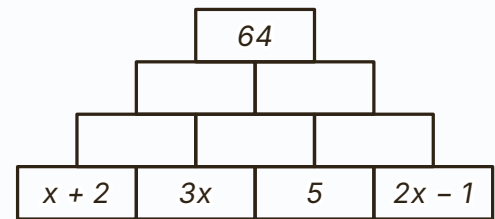
Answer

Total for D4: 4 marks

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

- E1** In this pyramid, each brick is the sum of the two bricks below it. The top brick is 64. [4 marks]

Work out the value of x .



Answer $x = \dots\dots$

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Fill in each row from the bottom up. Simplify each brick.
Hint 2 The second row is $4x + 2$, $3x + 5$, $2x + 4$. The third row is $7x + 7$ and $5x + 9$.
Hint 3 The top is $7x + 7 + 5x + 9 = 12x + 16$. So $12x + 16 = 64$, $12x = 48$ and $x = 4$.

How did it go?

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

- I can collect like terms, including negative ones. ☐ ☐ ☐
- I can simplify expressions with two kinds of term, such as x^2 and x . ☐ ☐ ☐
- I can simplify terms with fractions or decimals in front. ☐ ☐ ☐
- I can write and simplify an expression for a perimeter or a sum. ☐ ☐ ☐