

Algebra – Writing Expressions

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Some things to Remember

Expressions will not have =, \equiv or $>$ symbols.

Equations have = signs in and generally need solving for a specific value (or values) of x

Identities have this \equiv symbol. You generally have to prove these rather than solve them.

Inequalities have these symbols $<$, $>$, \leq or \geq . You might need to solve them or find specific values that satisfy them.

Writing Basic Algebraic Expressions

In each question below, write a simplified expression for the statement given.

- (1) x multiplied by x
- (2) x multiplied by y
- (3) x divided by y
- (4) 4 more than x
- (5) 4 less than x
- (6) The sum of x and y
- (7) 3 lots of x
- (8) 5 times x
- (9) Double x
- (10) Half of y
- (11) One fifth of x
- (12) Two thirds of x
- (13) x less than 7
- (14) 6 more than twice x
- (15) 12 less than 3 lots of x
- (16) 7 lots of 2 more than x
- (17) x multiplied by y multiplied by z
- (18) 4 times x times $2y$
- (19) $8x$ divided by $4y$
- (20) z more than the product of x and y

In each of the following questions explain why the expression in the question is wrong:

- (21) John says that p multiplied by q is $p \times q$.
- (22) Janet says that $10x$ divided by $5y$ is $2x \div y$
- (23) Fred thinks one half of x is $x \div 2$
- (24) Levi thinks that 3 of $x + 2$ is $3x + 2$
- (25) Bob thinks that $p \times p \times p$ is $3p$

Forming Expressions in Context

- (1) (a) Jamal has $3n$ coins. Kenny has 7 less coins than Jamal. Write an expression for the number of coins Kenny has.
(b) Shanice has twice as many coins as Kenny. Write an expression for the number of coins Shanice has.
- (2) Fred is N years old. Bill is 4 more than three times Fred's age. Jimmy is twice Bill's age. Show that an expression for the sum of their total ages can be written as $2(5N + 6)$
- (3) A rectangle has one side length of p and another of $2p$
Find a **simplified** expression for (a) the perimeter and (b) the area of the rectangle.

Forming and Solving Basic Equations

- (1) A triangle has side lengths $3p$, $4p$ and $5p$.
(a) Given that the perimeter of the triangle is 24, set up an equation involving p .
(b) Solve the equation to find the value of p .
- (2) Bill is t years old. Gill is 3 years older than Bill and John is twice Bill's age.
(a) Find an expression for the sum of their ages.
(b) Given that the sum of their ages is 79 set up and solve an equation to find the value of t .
(c) Hence find the age of each person.
- (3) The angles in a triangle are x° , $(x - 10)^\circ$ and $(2x + 10)^\circ$. By setting up and solving an equation for x , find the size of each angle.
- (4) Bobby has n ten pence coins and $4n$ two pence coins. Given that he has £6.12 in total, find the value of n .

Writing Expressions 'Ready for Proofs'

- (1) A kite has two right angles in. One other angle is x degrees. Write a **simplified** expression for the size of the remaining angle.
- (2) An isosceles triangle has ONLY **one** angle of size x degrees. Write a simplified expression for the size of the other angles in the triangle.
- (3) There are N counters in a bag. 8 are red and the rest blue. One counter is chosen at random. Write an expression for the probability of the counter being (a) red and (b) blue.