

Y7H U6 Expressions, Equations & Inequalities. Knowledge Organiser

An equation must have a =

The inequality symbols are $< > \leq \geq$

Manipulate equations using 2 or 3 steps including solving.

Solve the following equations

a) $4x + 7 = 19$

$(-7) \quad (-7)$

$4x = 12$

$(\div 4) \quad (\div 4)$

$x = 3$

b) $8x - 2 = 38$

$(+2) \quad (+2)$

$8x = 40$

$(\div 8) \quad (\div 8)$

$x = 5$

c) $50 - 11x = 17$

$50 = 11x + 17$

$33 = 11x$

$3 = x$

d) $\frac{4x-2}{2} = 11$

$4x - 2 = 22$

$4x = 24$

$x = 6$

Expand a single bracket involving algebra

Expand the following brackets:

a) $5(a + 7) = 5a + 35$

b) $9(2b - 3) = 18b - 27$

c) $c(c - 11) = c^2 - 11c$

Collect like terms where the terms are not a single variable

Simplify the following expressions

a) $6a + 3b + 8a + 9b = 14a + 12b$

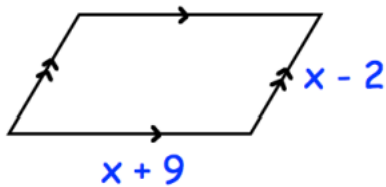
b) $8c - 7d - 9c + 4d = -c - 3d$

c) $5x^2 + 15x - 12x^2 - 6x = -7x^2 + 9x$

Form expressions, inequalities and equations from a variety of diagrams

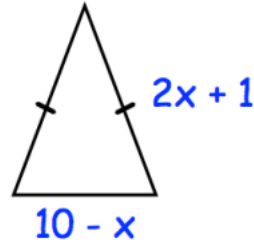
Write a simplified expression for the perimeter of the following shapes:

a)



$4x + 14$

b)



$3x + 12$

Factorise basic linear expressions

Factorise the following expressions:

a) $6x + 12$
 $= 6(x + 2)$

b) $2y - 8$
 $= 2(y - 4)$

c) $12w + 16$
 $= 4(3w + 4)$

d) $40 - 16p$
 $= 4(10 - 4p)$

Manipulate equations using several steps including solving.

Solve the following equations:

a) $9(5x - 1) = 81$ $45x - 9 = 81$
 $45x = 90$
 $x = 2$

b) $8x - 4 = 5x + 8$ $3x - 4 = 8$
 $3x = 12$
 $x = 4$

c) $\frac{5x}{3} = 2x - 1$ $5x = 6x - 3$
 $x = 3$

Manipulate inequalities using several steps.

Solve the following inequalities:

a) $8(4x + 1) < 72$ $32x + 8 < 72$
 $32x < 64$
 $x < 2$

b) $8x - 7 \leq 6x + 13$ $2x - 7 \leq 13$
 $2x \leq 20$
 $x \leq 10$

c) $\frac{5(x+4)}{3} > 10$ $5x + 20 > 30$
 $5x > 10$
 $x > 2$

Hegarty

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