Expanding brackets and simultaneous equations

FOIL
First Outter, Inner Last

(2005-1)

17 Expand the following expression, simplifying your answer as far as possible.

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

$x^2 + 5x - 3x - 15$

$x^2 + 2x - 15$.

18 Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$3x + 2y = 8$ (1)

$4x + 5y = 13$ (2)

$12x + 8y = 32$ (1) × 4

$-\ 12x + 15y = 39$ (2) × 3

$7y = 7$

$y = 1$

Sub into (1) (2 × 1)

$3x + 2 = 8$

$3x = 6$

$x = 2$

(2006-1)

2 Simplify $7(a + 3b) + a - 9b$ [3]

$= 7a + 21b + a - 9b$

$= 8a + 12b$

17 Expand the following expression, simplifying your answer as far as possible.

$(x + 5)(x - 3)$ [2]

$x^2 + 5x - 3x - 15$

$x^2 + 2x - 15$

18 Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$4x - 3y = 34$ (1)

$2x + 2y = 10$ (2) [4]

$4x - 3y = 34$ (1)

$-\ 4x + 4y = 20$ (2) × 2

$-7y = 14$

$y = -2$

$-3y$
$-4y$
$-7y$

-3×-2

Sub into (1)

$4x + 6 = 34$

$4x = 28$

$x = 7$

(2007-1)

2 Simplify $5(x-2y)+5x-5y$ [3]

$5x-10y+5x-5y$

$10x-15y$

[4]

13 Solve the equation $7(x-5)-5(x-4)=0$

$7x-35-5x+20$

$2x-15$

$-5x-4=+20$

15 Solve the following simultaneous equations by an algebraic (not graphical) method. Show all your working.

$4x+3y=12$ (1)

$6x+2y=33$ (2)

$12x+9y=36$ (1) × 3

$12x+4y=66$ (2) × 2

$5y=-30$

$y=-6$

[4]

Sub into (1)

$4x-18=12$

$4x=30$

$x=\frac{30}{4}=7.5$

$3x-6$

(2007-2)

13 a) Simplify $3(5n+1)+2(3n-2)$

$15n+3+6n-4$

$21n-1$

b) Expand $x(x^2+3)$

x^3+3x

c) Solve $\frac{t}{5}+4=9$

$\frac{t}{5}=9-4$

$\frac{t}{5}=5$

$t=5\times5$

$t=25$

[6]

(2008-2)

12 Solve the following simultaneous equations by an algebraic (not graphical) method.

Show all your working.

$3x - 2y = 23$ ①

$5x + 3y = 32$ ②

$15x - 10y = 115$ ① ×5

$15x + 9y = 96$ ② ×3

$-19y = 19$

$y = -1$

Sub into ① (−1×−2)

$3x + 2 = 23$

$3x = 21$

$x = 7$ [4]

(2009-2)

7 a) Expand $x(x^2 + 4)$ [1]

$x^3 + 4x$

b) Simplify $5(2n - 1) + 2(9 - 3n)$ [2]

$10n - 5 + 18 - 6n$

$4n + 13$

c) Solve **each** of the following equations

i) $5e - 9 = 3(e + 5)$ [5]

$5e - 9 = 3e + 15$

$5e - 3e = 15 + 9$

$2e = 24$

$e = 12$

ii) $\frac{d}{3} - 4 = 3$

$\frac{d}{3} = 3 + 4$

$\frac{d}{3} = 7$

$d = 7 \times 3$

$d = 21$

(2010-1)

11 Sara (→ x) calculates that five times her age and four times her brother's age (→ y) gives a total of 100. The sum of Sara's age and her brother's age is 22.

Find Sara's age and her brother's age.

Sim Equations in disguise

$5x + 4y = 100$ ①

$x + y = 22$ ②

$5x + 4y = 100$ ①

$5x + 5y = 110$ ② ×5

$y = 10$ $x = 12$

Sara is 12

Her brother is 10. [4]

(2010-2)

3 c) Expand $b(3b - 2)$ [2]

$3b^2 - 2b$