

MULTIPLYING BINOMIALS - FOIL $(x+3)(x-2)$

1. Expand and Simplify.

a) $(x-7)(x-4)$

$$= (x)(x) + (x)(-4) + (-7)(x) + (-7)(-4)$$

$$= x^2 - 4x - 7x + 28$$

$$= x^2 - 11x + 28$$

b) $(x-8)(x+8)$

$$= (x)(x) + (x)(8) + (-8)(x) + (-8)(8)$$

$$= x^2 + 8x - 8x - 64$$

$$= x^2 - 64$$

c) $(x+9)(x-3)$

$$= (x)(x) + (x)(-3) + (9)(x) + (9)(-3)$$

$$= x^2 - 3x + 9x - 27$$

$$= x^2 + 6x - 27$$

d) $(-3+2x)(-10+x)$

$$= (-3)(-10) + (-3)(x) + (2x)(-10) + (2x)(x)$$

$$= 30 - 3x - 20x + 2x^2$$

$$= 2x^2 - 23x + 30$$

e) $(2x+1)(3x+7)$

$$= (2x)(3x) + (2x)(7) + (1)(3x) + (1)(7)$$

$$= 6x^2 + 14x + 3x + 7$$

$$= 6x^2 + 17x + 7$$

f) $(3x-4)(3x+5)$

$$= (3x)(3x) + (3x)(5) + (-4)(3x) + (-4)(5)$$

$$= 9x^2 + 15x - 12x - 20$$

$$= 9x^2 + 3x - 20$$

g) $(2x-3)^2$

$$= (2x-3)(2x-3)$$

$$= (2x)(2x) + (2x)(-3) + (-3)(2x) + (-3)(-3)$$

$$= 4x^2 - 6x - 6x + 9$$

$$= 4x^2 - 12x + 9$$

h) $(4+2a)(3+2a)$

$$= (4)(3) + (4)(2a) + (2a)(3) + (2a)(2a)$$

$$= 12 + 8a + 6a + 4a^2$$

$$= 4a^2 + 14a + 12$$

2. Using the picture of the following basketball court,

a) Write a **trinomial expression** for the area of the court

$$A = lw$$

$$A = (x+1)(x-11)$$

$$A = (x)(x) + (x)(-11) + (1)(x) + (1)(-11)$$

$$A = x^2 - 11x + 1x - 11$$

$$A = x^2 - 10x - 11$$

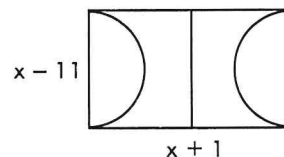
b) Find the area of the basketball court if $x = 25$ m

$$A = x^2 - 10x - 11$$

$$A = (25)^2 - 10(25) - 11$$

$$A = 625 - 250 - 11$$

$$A = 364 \text{ m}^2$$



3. Simplify each expression.

a) $(r + 6)(r - 3)$

$$\begin{aligned}
 &= (r)(r) + (r)(-3) + (6)(r) + (6)(-3) \\
 &= r^2 - 3r + 6r - 18 \\
 &= r^2 + 3r - 18
 \end{aligned}$$

b) $(p + 7)(9p - 5)$

$$\begin{aligned}
 &= (p)(9p) + (p)(-5) + (7)(9p) + (7)(-5) \\
 &= 9p^2 - 5p + 63p - 35 \\
 &= 9p^2 + 58p - 35
 \end{aligned}$$

c) $(3s + 8)^2$

$$\begin{aligned}
 &= (3s + 8)(3s + 8) \\
 &= (3s)(3s) + (3s)(8) + (8)(3s) + (8)(8) \\
 &= 9s^2 + 24s + 24s + 64 \\
 &= 9s^2 + 48s + 64
 \end{aligned}$$

d) $(7n + 5)(n + 4)$

$$\begin{aligned}
 &= (7n)(n) + (7n)(4) + (5)(n) + (5)(4) \\
 &= 7n^2 + 28n + 5n + 20 \\
 &= 7n^2 + 33n + 20
 \end{aligned}$$

e) $(2r - 6)(r + 9)$

$$\begin{aligned}
 &= (2r)(r) + (2r)(9) + (-6)(r) + (-6)(9) \\
 &= 2r^2 + 18r - 6r - 54 \\
 &= 2r^2 + 12r - 54
 \end{aligned}$$

f) $(5n + 6)(8n - 7)$

$$\begin{aligned}
 &= (5n)(8n) + (5n)(-7) + (6)(8n) + (6)(-7) \\
 &= 40n^2 - 35n + 48n - 42 \\
 &= 40n^2 + 13n - 42
 \end{aligned}$$

g) $(5a + 6)(8a + 7)$

$$\begin{aligned}
 &= (5a)(8a) + (5a)(7) + (6)(8a) + (6)(7) \\
 &= 40a^2 + 35a + 48a + 42 \\
 &= 40a^2 + 83a + 42
 \end{aligned}$$

h) $(z - 3)(z + 3)$

$$\begin{aligned}
 &= (z)(z) + (z)(3) + (-3)(z) + (-3)(3) \\
 &= z^2 + 3z - 3z - 9 \\
 &= z^2 - 9
 \end{aligned}$$

i) $(r - 2)(r + 3)$

$$\begin{aligned}
 &= (r)(r) + (r)(3) + (-2)(r) + (-2)(3) \\
 &= r^2 + 3r - 2r - 6 \\
 &= r^2 + 1r - 6
 \end{aligned}$$

j) $(s + 9)(6s - 8)$

$$\begin{aligned}
 &= (s)(6s) + (s)(-8) + (9)(6s) + (9)(-8) \\
 &= 6s^2 - 8s + 54s - 72 \\
 &= 6s^2 + 46s - 72
 \end{aligned}$$