

## Lesson 8

## Multiplying Polynomials

A.  $(y + 8)(y - 4) = y(y - 4) + 8(y - 4)$  Distributive Property  
 $= y \cdot y - y \cdot 4 + 8 \cdot y - 8 \cdot 4$  Distributive Property  
 $= y^2 - 4y + 8y - 32$  Multiply  
 $= y^2 + 4y - 32$  Combine Like Terms



The shortcut method of the Distributive Property is called **FOIL**, which can be used when multiplying two binomials. (First, Outer, Inner, Last)

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B.  $(z + 6)(z + 12) = z \cdot z + z \cdot 12 + 6 \cdot z + 6 \cdot 12$   
 $= z^2 + 12z + 6z + 72$  Multiply  
 $= z^2 + 18z + 72$  Combine Like Terms

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C.  $(5x + 4)(2x + 8) = 5x \cdot 2x + 5x \cdot 8 + 4 \cdot 2x + 4 \cdot 8$   
 $= 10x^2 + 40x + 8x + 32$  Multiply  
 $= 10x^2 + 48x + 32$  Combine Like Terms

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D.  $(x + 2)(x + 3) = x \cdot x + x \cdot 3 + 2 \cdot x + 2 \cdot 3$   
 $= x^2 + 3x + 2x + 6$  Multiply  
 $= x^2 + 5x + 6$  Combine Like Terms

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Lesson 8-3 *Multiplying Binomials (and other Polynomials)*

Practice:

1.  $(y + 4)(y + 3)$

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2.  $(x - 2)(x + 6)$

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3.  $(a - 8)(a + 5)$

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4.  $(4h + 5)(h + 7)$

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5.  $(9p - 1)(3p - 2)$

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6.  $(2g + 7)(5g - 8)$

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## Lesson 8.3

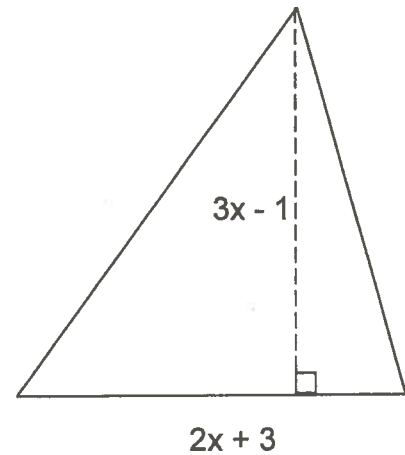
## Multiplying Polynomials

Multiplying Polynomials (Other than 2 Binomials)

$$\begin{aligned}
 \text{E. } (3a + 4)(a^2 - 12a + 1) &= 3a(a^2 - 12a + 1) + 4(a^2 - 12a + 1) \\
 &= 3a^3 - 36a^2 + 3a + 4a^2 - 48a + 4 \\
 &= 3a^3 - 32a^2 - 45a + 4
 \end{aligned}$$

$$\begin{aligned}
 \text{F. } (2b^2 + 7b + 9)(b^2 + 3b - 1) &= 2b^2(b^2 + 3b - 1) + 7b(b^2 + 3b - 1) + 9(b^2 + 3b - 1) \\
 &= 2b^4 + 6b^3 - 2b^2 + 7b^3 + 21b^2 - 7b + 9b^2 + 27b - 9 \\
 &= 2b^4 + 13b^3 + 28b^2 + 20b - 9
 \end{aligned}$$

- G. The area  $A$  of a triangle is half the product of the base  $b$  times the height  $h$ . Write a polynomial expression that represents the area of the triangle at the right.



$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(2x+3)(3x-1)$$

$$A = (x+1.5)(3x-1)$$

$$A = 3x^2 - x + 4.5x - 1.5$$

$$A = 3x^2 + 3.5x - 1.5$$

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Lesson 8-3 *Multiplying Binomials (and other Polynomials)*

Practice:

7.  $(3b - 2c)(6b + 5c - 2) =$  \_\_\_\_\_  
= \_\_\_\_\_  
= \_\_\_\_\_

8.  $(3z + 2)(4z^2 + 3z + 5) =$  \_\_\_\_\_  
= \_\_\_\_\_  
= \_\_\_\_\_

9.  $(3x^2 + 2x + 1)(4x^2 - 3x - 2) =$  \_\_\_\_\_  
= \_\_\_\_\_  
= \_\_\_\_\_

10. The area of a rectangle is the measure of the base times the height. Write an expression for the area of the rectangle.

