

5.1 Warm-Up

1. Evaluate each expression for $x = 2$ and $y = -3$.

a) $(x + y)(x - y)$

b) $x^2 + 5xy - 7y^2$

2. For each expression, multiply the monomial by the polynomial.

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

b) $-2y(5y - 8)$

3. Simplify each expression.

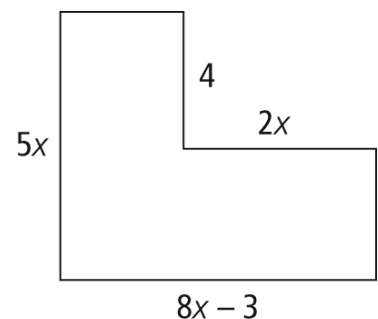
a) $(x^2 - 5x + 9) + (x^2 + 10x - 12)$

b) $(5x^2 + 7xy - 4) - (8x^2 - xy + 3)$

4. a) A ruler is 26 cm in length. A piece x cm in length breaks off. Write an expression for the length that is left.

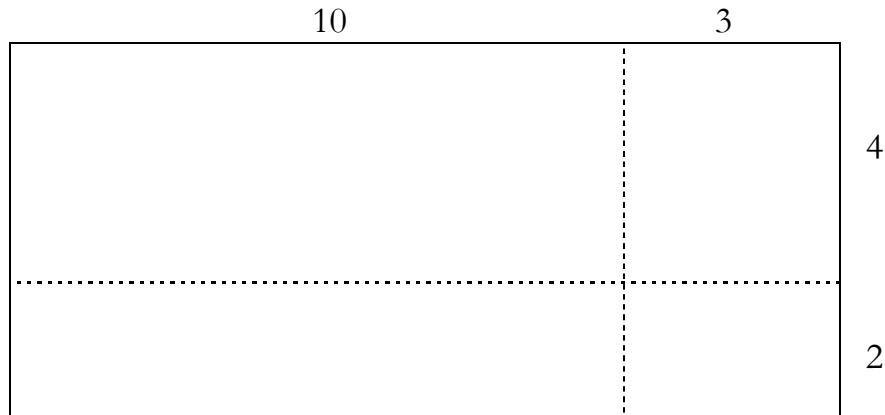
- b) The radius of a circle is y cm. What is an expression for the diameter of the circle?

5. Write an expression to represent the area of the figure.



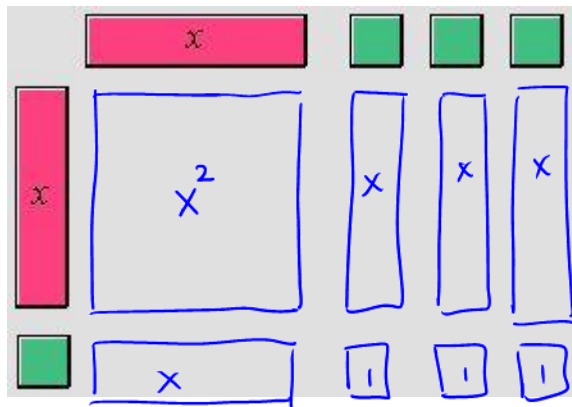
5.1a Multiplying Binomials

How many different ways can we calculate the area of the rectangle below?



This is the area represented by the dimensions $(x+3)(x+1)$:

$$x^2 + 4x + 3$$



or

	x	$+3$
x	x^2	$3x$
$+1$	x	3

Sketch the resulting area. What product does this area represent?

How do we represent $(x+5)(x-2)$? What is the product?

	x	$+5$
x	x^2	$5x$
-2	$-2x$	-10

shortcut

$$x^2 + 3x - 10$$

How do we represent $(2x+4)(3x-1)$? What is the product?

$$\begin{array}{c} \begin{array}{cc} 2x & +4 \\ \hline 3x & \begin{array}{|c|c|} \hline 6x^2 & 12x \\ \hline \end{array} \\ -1 & \begin{array}{|c|c|} \hline -2x & -4 \\ \hline \end{array} \end{array} \end{array}$$

$$6x^2 + 10x - 4$$

How do we show the dimensions for $(x+3)^2$? What is the product?

$$\begin{array}{c} \begin{array}{cc} x & +3 \\ \hline x & \begin{array}{|c|c|} \hline x^2 & 3x \\ \hline \end{array} \\ +3 & \begin{array}{|c|c|} \hline 3x & 9 \\ \hline \end{array} \end{array} \end{array}$$

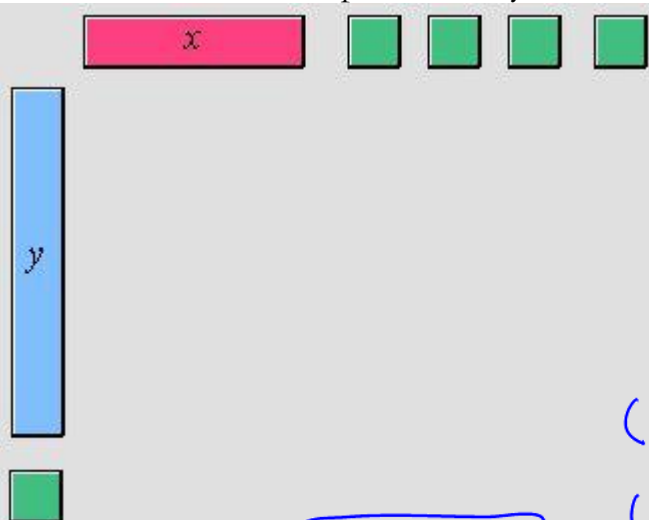
$$(x+3)(x+3) = x^2 + 6x + 9$$

$$(x+2)(x^2 + 3x + 5)$$

$$\begin{array}{c} \begin{array}{ccc} x^2 & +3x & +5 \\ \hline x & \begin{array}{|c|c|c|} \hline x^3 & 3x^2 & 5x \\ \hline \end{array} \\ +2 & \begin{array}{|c|c|c|} \hline 2x^2 & 6x & 10 \\ \hline \end{array} \end{array} \end{array}$$

$$x^3 + 5x^2 + 11x + 10$$

What dimensions are represented by the following? What is the product?



$$\begin{array}{c} \begin{array}{cc} x & +4 \\ \hline y & \begin{array}{|c|c|} \hline xy & 4y \\ \hline \end{array} \\ +1 & \begin{array}{|c|c|} \hline x & 4 \\ \hline \end{array} \end{array} \end{array}$$

$$(x+4)(y+1) = xy + 4y + x + 4$$

$$(3+4)(2+1) = (3)(2) + 4(2) + (3) + 4$$

$$21 = 21$$

Evaluate the product if $x=3$ and $y=2$.

For next day:

What is a Polynomial? More specifically, what is a Binomial?

p209 #1, 2, 13, 14