

## Algebraic Expressions Guided Notes

1. How can we simplify  $2x(3x^2 + 4x^5)$ ?

$$\begin{aligned} 2x \times 3x^2 + 2x \times 4x^5 \\ 6x^3 + 8x^6 \end{aligned}$$

2. Write  $2x \times \frac{(5y-y)}{2}$  in a simplified form.

$$2x \times \frac{4y}{2}$$

$$2x \times 2y$$

$$4xy$$

3. Evaluate the algebraic expression for the given value  $x = 10$ .

$$5(x + 2) \div 2x - 14.$$

$$5(10 + 2) \div 20 - 14$$

$$5(12) \div 20 - 14$$

$$60 \div 20 - 14$$

$$3 - 14$$

$$-11$$

4. The Pentagon building in Washington, D.C., is shaped like a regular pentagon. If the length of one side of the Pentagon is represented by  $n + 2$ , find the perimeter?

$$\text{Perimeter} = 5 \times (n + 2)$$

$$\text{Perimeter} = 5n + 10$$

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## Problem 1

$$\text{Simplify } \frac{(2^2 - 2)}{\sqrt{2}}$$

First we evaluate the expression inside the parentheses by evaluating the powers and do the subtraction.

$$\begin{aligned} &= \frac{(4 - 2)}{\sqrt{2}} \\ &= \frac{2}{\sqrt{2}} \end{aligned}$$

We then remove the parentheses and multiply both the denominator and the numerator by  $\sqrt{2}$ .

$$= \frac{2\sqrt{2}}{\sqrt{2}\sqrt{2}}$$

As a last step we do all multiplications and division from left to right.

$$\begin{aligned} &= \frac{2\sqrt{2}}{2} \\ &= \sqrt{2} \end{aligned}$$

## PROBLEM 2

$$\text{Simplify } x^3(x^4 + 5x^2)$$

We apply the distributive law.

We multiply  $x^3$  by  $x^4$ , and multiply  $x^3$  by  $5x^2$ .

$$x^3 \times x^4 + x^3 \times 5x^2$$

Then we apply the power rule of the exponents

$$x^{3+4} + 5x^{3+2}$$

$$x^7 + 5x^5$$

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### PROBLEM 3

Simplify  $2x \frac{(6x - 4x)}{2}$

First, we evaluate the expression inside the parentheses by doing the subtraction then doing the division.

$$2x \frac{(2x)}{2}$$

$$2x(x)$$

Then we apply the commutative rule

$$2(x \cdot x)$$

Then we do the multiplication using the power rule from the exponent rules.

$$2(x^{1+1})$$

$$2(x^2)$$