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Date _____
Algebra

Operations with Polynomials

1. What is the expression $(x^2 - 5x - 2) + (-6x^2 - 7x - 3)$ equivalent to in simplest terms?

$$\begin{array}{r} x^2 - 5x - 2 \\ + 6x^2 - 7x - 3 \\ \hline -5x^2 - 12x - 5 \end{array}$$

2. If $A = -2x^2 + 5x - 7$ and $B = 7x^2 + 3x + 2$, What is $A - B$?

$$\begin{array}{r} (-2x^2 + 5x - 7) - (7x^2 + 3x + 2) \\ \hline -2x^2 + 5x - 7 \\ + -7x^2 - 3x - 2 \\ \hline -9x^2 + 2x - 9 \end{array}$$

3. If $A = -2x^2 + 5x - 7$ and $B = 7x^2 + 3x + 2$, What is $B - A$?

$$\begin{array}{r} (7x^2 + 3x + 2) - (-2x^2 + 5x - 7) \\ \hline 7x^2 + 3x + 2 \\ + 2x^2 - 5x + 7 \\ \hline 9x^2 - 2x + 9 \end{array}$$

4. What is the result when $5m^3 + 3m - 1$ is subtracted from $7m^2 - 5m + 1$?

$$\begin{array}{r} (7m^2 - 5m + 1) - (5m^3 + 3m - 1) \\ \hline 7m^2 - 5m + 1 \\ + -5m^3 - 3m + 1 \\ \hline -5m^3 + 7m^2 - 8m + 2 \end{array}$$

5. What is the result when $7xy + 5y - 2x$ is subtracted from $9xy - 5y$?

$$\begin{array}{r} (9xy - 5y) - (7xy + 5y - 2x) \\ \hline 9xy - 5y \\ + -7xy - 5y + 2x \\ \hline 2xy - 10y + 2x \end{array}$$

6. What is the result when $9g^2 - 8g - 2$ is subtracted from $7g^3 + 8g$?

$$\begin{array}{r} (7g^3 + 8g) - (9g^2 - 8g - 2) \\ \hline 7g^3 + 8g \\ + -9g^2 + 8g + 2 \\ \hline 7g^3 - 9g^2 + 16g + 2 \end{array}$$

7. Which expression is equivalent to $-3x(x - 4) - 2x(x + 3)$?

$$\begin{array}{r} -3x^2 + 12x - 2x^2 - 6x \\ \hline -5x^2 + 6x \end{array}$$

8. Which expression represents $\frac{12x^3 - 6x^2 + 2x}{2x}$ in simplest form?

$$6x^2 - 3x + 1$$

To subtract, keep, change, change

9. What is the product of $-3x^2y$ and $(5xy^2 + xy)$?

$$-3x^2y(5xy^2 + xy) = -15x^3y^3 - 3x^3y^2$$

10. The quotient of $\frac{8x^5 - 2x^4 + 4x^3 - 6x^2}{2x^2}$ is

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

11. $(x^2 + 2x - 4)(x + 3)$

	x^2	$+2x$	-4	
\times	x^3	$+2x^2$	$-4x$	
$+3$	$3x^2$	$+6x$	-12	

$$x^3 + 5x^2 + 2x - 12$$

12. $(2x^2 + 3x - 2)(x - 2)$

	$2x^2$	$+3x$	-2	
\times	$2x^3$	$+3x^2$	$-2x$	
-2	$-4x^2$	$-6x$	$+4$	

$$2x^3 - x^2 - 8x + 4$$

13. $(3x^2 + x - 5)(x - 4)$

	$3x^2$	$+x$	-5	
\times	$3x^3$	$+x^2$	$-4x$	
-4	$-12x^2$	$-4x$	$+20$	

$$3x^3 - 11x^2 - 8x + 20$$

14. $(2y^2 - 3y - 1)(y + 7)$

	$2y^2$	$-3y$	-1	
\times	$2y^3$	$-3y^2$	$-y$	
$+7$	$14y^2$	$-21y$	-7	

$$2y^3 + 11y^2 - 22y - 7$$

15. Express MP in simplest terms if $M = 2x^2 + 6$ and $P = x^2 + 3x - 1$.

	x^2	$+3x$	-1	
$2x^2$	$2x^4$	$+6x^3$	$-2x^2$	
$+6$	$+6x^2$	$+18x$	-6	

$$2x^4 + 6x^3 + 4x^2 + 18x - 6$$

$$(2x^2 + 6)(x^2 + 3x - 1)$$

16. Find the area of a rectangle whose length is $x^2 - 6x + 2$ and width is $3x^2 + 3$ in simplest terms.

$$A = lw$$

$$A = (x^2 - 6x + 2)(3x^2 + 3)$$

	x^2	$-6x$	$+2$	
$3x^2$	$3x^4$	$-18x^3$	$+6x^2$	
$+3$	$+3x^2$	$-18x$	$+6$	

$$A = 3x^4 - 18x^3 + 9x^2 - 18x + 6$$