

Baker High School Summer Math Packet

For Rising Precalculus/Honors Precalculus Students

This packet is an optional review of the skills that will help you be successful in Precalculus/Honors Precalculus. By completing this packet over the summer, you will not only keep your brain mathematically active but you will be able to identify skills that you need to strengthen for your year ahead. Complete the exercises on a separate sheet of paper then check your answers with the Answer Key provided. Enjoy your math review and we look forward to meeting you in August!

I. Linear Functions, Evaluating and Simplifying Expressions

Write the appropriate Linear Equation for each of the following.

1. The point-slope form given $(-3, 10)$ with $m = -4$.
2. The standard form given $(-2, 6)$ & $(5, 2)$.
3. The slope-intercept form given $(-1, -5)$ & $(6, 0)$.
4. The slope-intercept form given $(6, -5)$ & perpendicular to $-5x - 7y$
5. The standard form of the line parallel to the given line $y = 3x$.

Solve and check each linear equation.

A. $3(x - 2) + 7 = 2(x + 5)$

B. $3(x - 4) - 4(x - 3) = x - (x - 2)$

Calculate the slope between each pair of points.

A. $(-2, 1), (2, 2)$

B. $(4, -2), (3, -2)$

C. $(5, 3), (5, -7)$

Solve and check each linear equation.

A. $\frac{x}{4} = 2 + \frac{x-3}{3}$

B. $\frac{x+3}{6} = \frac{3}{8} + \frac{x-5}{4}$

Write equations in **Point-Slope Form** and **Slope-Intercept Form** to satisfy the given conditions. **Point-Slope Form:** $y - y_1 = m(x - x_1)$; **Slope-Intercept Form:** $y = mx + b$.

Conditions	<u>Point-Slope Form</u>	<u>Slope-Intercept Form</u>
A. Slope: -5 , passing through $(-4, -2)$		
B. Slope: $-\frac{2}{3}$, passing through the origin		
C. Passing through $(3, 5)$ and $(8, 15)$		
D. x-intercept: 4 , y-intercept: -2		
E. Passing through $(-2, -7)$, <u>parallel</u> to $y = -5x + 4$		

Evaluate each algebraic expression for the given value of the variable or variables. Show your work.

A. $5x + 7$; $x = 4$

B. $6(x + 5) - 13$; $x = -7$

C. $\frac{1-(x-2)^2}{1+(x-2)^2}$; $x = -1$

D. $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$,

Simplify each exponential expression, then evaluate **without using a calculator**.

A. $(-2)^4$

B. -2^4

C. $2^2 \cdot 2^3$

D. $(5^3)^0$

E. $\frac{3^8}{3^5}$

F. $2^{-4} \cdot 2^2$

Simplify each exponential expression. Write your final answer using only positive exponents.

A. $x^{-2}y$

B. x^0y^5

C. $x^{-10} \cdot x^5$

D. $(x^{-2})^{-3}$

E. $\frac{x^{14}}{x^{-7}}$

F. $(-3x^2y^5)^2$

Simplify each expression. Assume all variables are positive.

A. $\sqrt{50}$

B. $\sqrt{45x^2}$

C. $\sqrt{2x^2} \cdot \sqrt{6x}$

D. $\frac{\sqrt{150x^4}}{\sqrt{3x}}$

E. $7\sqrt{3} + \sqrt{3}$

F. $\sqrt{8} + 3\sqrt{2} - 2\sqrt{32}$

G. $\frac{2}{\sqrt{3}}$

H. $\frac{5}{2+\sqrt{3}}$

II. Factoring

Factor out the greatest common factor.

A. $3x^2 + 6x$

B. $9x^4 - 18x^3 + 27x^2$

Factor by grouping.

A. $x^3 - 2x^2 + 5x - 10$

B. $x^3 - x^2 + 2x - 2$

Factor each trinomial.

A. $x^2 + 5x + 6$

B. $x^2 - 2x - 15$

C. $x^2 - 8x + 15$

D. $3x^2 - 25x - 28$

Factor the difference of squares. $a^2 - b^2 = (a + b)(a - b)$

A. $x^2 - 100$

B. $64x^2 - 81$

Factor any perfect square trinomials, or state that the polynomial is prime.

$$a^2 + 2ab + b^2 = (a + b)^2, \quad a^2 - 2ab + b^2 = (a - b)^2$$

A. $x^2 + 2x + 1$

B. $x^2 - 14x + 49$

C. $4x^2 + 4x + 1$

D. $9x^2 - 6x + 1$

Factor completely.

A. $4x^2 - 4x - 24$

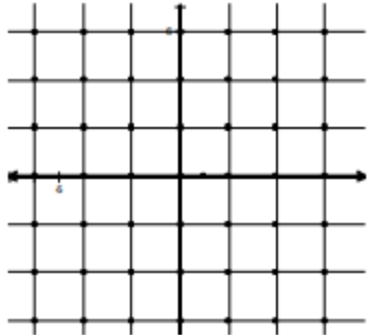
B. $2x^4 - 162$

C. $x^3 + 2x^2 - 9x - 18$

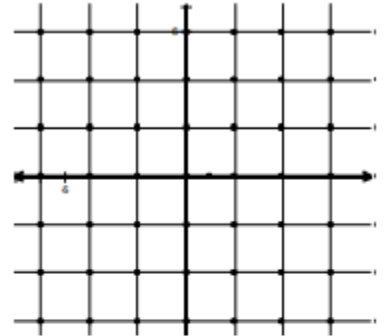
D. $x^3 - 4x$

III. Graph the following equations.

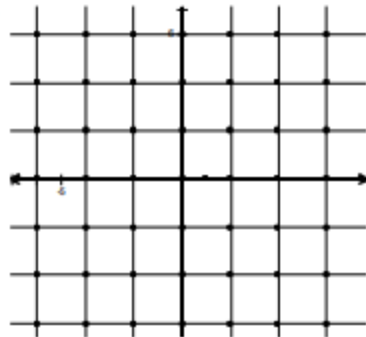
$$3x - 4y = 12$$



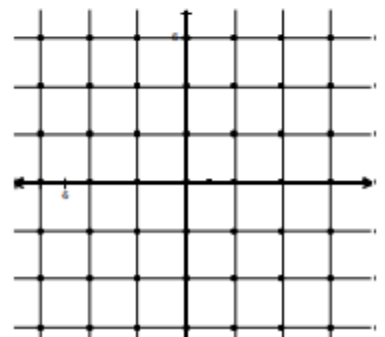
$$\begin{cases} 2x + y = 4 \\ x - y = 2 \end{cases}$$



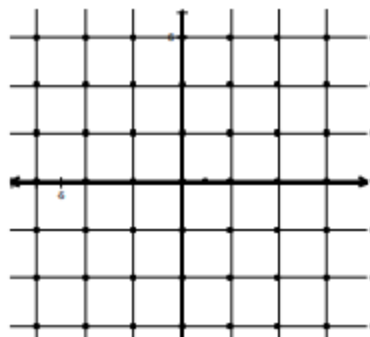
$$y < -4x - 2$$



$$y + 2 = |x + 1|$$



$$y + 4 = (x - 1)^2$$



$$y > |x| - 1$$

