

WATKINS MILL HS
SUMMER REVIEW PACKET
IB PRECALCULUS
DUE 1st DAY OF CLASS
IN AUGUST

Summer Review for students entering IB Precalculus

- Write the equation for the linear function f in slope-intercept form. If
 - line $y = f(x)$ contains points $(-4, 6)$ and $(-1, 2)$.
 - the graph of $f(x)$ passes through point $(0, 5)$ and is parallel to the line $x + 3y = 6$.
 - The graph of the function passes through point $(1, 2)$ and is perpendicular to the line $2x - 3y = 5$.
- Write the equation for the quadratic function in the form $f(x) = ax^2 + bx + c$ if the graph of the function contains the given points
 - $(-2, 0)$, $(4, 0)$ and $(0, -8)$
 - $(1, 5)$ and vertex $(-1, -3)$
 - $(-1, -6)$, $(0, -4)$, and $(1, 4)$
- P' and Q' are images of points $P(1, 4)$ and $Q(2, -3)$. Write the coordinates of P' and Q' .
 - P and Q are reflected across the x -axis.
 - P and Q are reflected across the y -axis.
 - P and Q are translated 4 units and 3 units up.
 - P and Q are reflected across the origin.
 - P and Q are reflected across the $y = x$.
- Sketch the graphs of the following functions. Plot at least 5 points. **Do not use your calculator.** State the domain and the range of each function.
 - $f(x) = x^2$ and $g(x) = (x+1)^2 - 3$
 - $f(x) = x^3$ and $g(x) = -(x-2)^3$
 - $f(x) = \sqrt{x}$ and $g(x) = \sqrt{2-x}$
 - $f(x) = \sqrt[3]{x}$ and $g(x) = \sqrt[3]{x+2} - 1$
 - $f(x) = 2^x$ and $g(x) = 2^{-x}$
 - $f(x) = \log_2 x$ and $g(x) = \log_2(x-1) + 3$
 - $f(x) = \frac{1}{x}$ and $g(x) = \frac{1}{x+3} - 2$
- Graph the function
 - $f(x) = \begin{cases} x^2, & x < 0 \\ \sqrt{x}, & x \geq 0 \end{cases}$
 - $g(x) = \begin{cases} -x-2, & -5 \leq x < -2 \\ -x^2, & -2 \leq x \leq 2 \\ x-2, & 2 < x \leq 4 \end{cases}$
- Solve the following equations by completing the square.
 - $x^2 + 10x = 11$
 - $x^2 - 14x = 15$

7. Consider functions $f(x) = \frac{1}{x}$ and $g(x) = x^2 - 4$.

- Write the domain and the range of the functions.
- Find the equations and write the domain for $f + g$ and f/g .
- Find the equations and write the domain for f^{-1} and g^{-1} .
- Find the equations and write the domain for $f \circ g$, and $g \circ f$.

8. Simplify the following expressions.

a) $5x^2 \cdot 2x^5$	b) $(-4a^3)^{-2}$	c) $\left(2^{\frac{1}{5}} \cdot 3^{\frac{2}{5}}\right)^5$
d) $8^{\frac{5}{3}}$	e) $\left(\sqrt[3]{a^5} \cdot \sqrt[3]{a^4}\right)^{-4}$	f) $\sqrt[4]{48x^4} - x\sqrt[4]{3}$
g) $\frac{\sqrt[3]{2x^2} \cdot \sqrt[3]{4x^2}}{\sqrt[3]{x}}$	h) $e^{\ln x^2}$	i) $\log_3 27$
j) $\frac{\frac{1}{x} - \frac{1}{x+1}}{\frac{1}{x} - \frac{1}{x-1}}$	k) $\frac{x^2 + 2ax}{2a - x} \cdot \frac{x^2 - 3ax + 2a^2}{a^2 - x^2} \div \frac{x + 2a}{x + a}$	

9. Solve the following equations.

a) $3 - 2m = 3m + 1$	b) $\frac{1}{3}x = 2 - \frac{2}{3}x$	c) $x^3 - 2x^2 - 4x + 8 = 0$
d) $2x^2 + 5x - 3 = 0$	e) $x^3 - 64 = 0$	f) $x^4 - 13x^2 + 36 = 0$
g) $\sqrt{x+5} = 2\sqrt{x}$	h) $\sqrt{x-3} = x-5$	i) $\sqrt{x+1} = \sqrt{x+6} - 1$
j) $8^{2x+3} = 4 \cdot 2^{x+1}$	k) $\frac{x+1}{3x-6} = \frac{5x}{6} + \frac{1}{x-2}$	l) $\frac{x+2}{x-2} + \frac{x-2}{x+2} = \frac{8-4x}{x^2-4}$
m) $\frac{x-4}{x-2} = \frac{1}{x-4}$	n) $\log_2(2x-1) = 3$	o) $\log(x+2) + \log(x+5) = 1$

10. Solve each equation for y .

a) $x^2 - y^2 = 4$	b) $x^2 - 2xy + y^2 = 4$	c) $x + y^2 = 4$
--------------------	--------------------------	------------------

11. Solve each inequality. Write the answer in interval notation.

a) $4x - x^2 \geq 0$	b) $x^2 + 2x - 15 < 0$	c) $x^2 - 6x \geq -9$
----------------------	------------------------	-----------------------

12. Solve each system of equations.

a) $\begin{cases} x = 4y - 3 \\ x^2 - 4y^2 = 9 \end{cases}$	b) $\begin{cases} 5x^2 + y^2 = 30 \\ 9x^2 - y^2 = -16 \end{cases}$
---	--