

# IB MATH STUDIES SUMMER REVIEW PACKET

## DUE THE FIRST DAY OF SCHOOL

The problems in the packet are designed to help you review topics from previous courses that are important to your success in IB Math Studies.

Please try to do each problem yourself. Show your work, on a separate sheet of paper, that explains how you got your answer. You may use words, symbols, or both in your explanation.

Bring the finished packet with you to you class on the first day of school. You will be assessed on these skills during the first week of school as part of your 1<sup>st</sup> quarter grade.



Enjoy your summer! ☺ We are looking forward to seeing you in August. If you have any questions, please contact the mathematics Resource Teacher at  
Laura\_D\_Goetz@mcpsmd.org

1) Expand (FOIL!):

a)  $(x + 3)(x + 1) =$

b)  $(x - 5)(x + 4) =$

c)  $(x - 6)^2 =$

d)  $(2x - 1)(4x + 3) =$

2) Factor:

a)  $x^2 - 4x - 12 =$

b)  $x^2 - 6x + 8 =$

c)  $x^2 + 12x + 35 =$

d)  $x^2 - 36 =$

e)  $2x^2 - 5x - 3 =$

f)  $3x^2 + 13x - 10 =$

g)  $x^2 + 4x - 10 =$

(hint: use quadratic formula!)

3) Factor (by collecting common terms):

a)  $4x^4y + 12x^2y^2 =$

b)  $6x^3y^3 - 2xy =$

c)  $14a^2b^5 - 7a^4b^2 =$

4) Rewrite each with a single exponent:

a)  $\sqrt{x} =$

b)  $\sqrt[3]{x} =$

c)  $\frac{1}{x^4} =$

d)  $\frac{6}{x^3} =$

e)  $\frac{1}{\sqrt{x}} =$

f)  $\sqrt[3]{x^5} =$

g)  $\frac{x^6}{x^2} =$

h)  $\frac{x^3}{x^7} =$

i)  $\frac{x}{\sqrt{x}} =$

j)  $\frac{4\sqrt{x}}{2x} =$

5) Simplify each expression.

a)  $\left(\frac{2}{7}\right)\left(\frac{21}{10}\right) =$

b)  $\frac{\frac{8}{3}}{\frac{2}{9}} =$

c)  $\frac{\frac{4}{9}}{2} =$

d)  $\frac{\frac{1}{2} - \frac{5}{4}}{\frac{3}{8}} =$

e)  $(2^2)(2^3) =$

f)  $3^{-2} =$

g)  $(2^3)^2 =$

6) Simplify each expression

a)  $\frac{5}{x^5} =$

b)  $\frac{\frac{2}{x^2}}{\frac{10}{x^5}} =$

c)  $(3x)^2 =$

d)  $\frac{4x^{-2}y^3}{8xy} =$

e)  $(5a^3)(4a^2) =$

f)  $(4x^2)^3 =$

7) Solve for  $x$  (remember – no calculator!):

a)  $6x - 10 = 14 - x$

b)  $3x^2 = 27$

c)  $\frac{2}{5}x = 8$

d)  $\frac{x}{10} = \frac{3}{8}$

e)  $5\sqrt{x} = 50$

f)  $\sqrt{2x} = 6$

g)  $x^3 = 8$

h)  $2x^3 = 54$

i)  $2\sqrt{x} + 9 = 21$

j)  $-2x^2 - 7 = 41 - 5x^2$

8) Solve for z:

a)  $4x + 10yz - 3 = 0$

b)  $y^2 + 3yz - 8z - 4x = 0$

9) Solve for x (still no calculator!):

a)  $x^2 - 8x + 15 = 0$

b)  $x^2 = -9x - 14$

c)  $2x^2 + 7x - 18 = x^2 + 4x$

d) Determine all points of intersection (using algebra) between the parabola  $y = x^2 + 3x - 4$  and the line  $y = 5x + 11$

10) Given  $f(x) = \frac{x}{x+3}$ ,  $g(x) = \sqrt{x-3}$ ,  $h(x) = x^2 + 5$ , find (hint: “compositions”)

a)  $h(g(x))$

b)  $f(f(3))$

11) Find the slope between the points  $(-2,4)$  and  $(6,-1)$ .

12) Using either the slope-intercept (hint:  $y = mx + b$ ) or point-slope

(hint:  $y - y_1 = m(x - x_1)$ ) form of a line to write the equation for the lines described:

a) with slope  $-2$  and containing the point  $(3,4)$

b) containing the points  $(1,-3)$  and  $(-5,2)$

c) with slope  $0$  and containing the point  $(4,2)$

d) parallel to line  $2x - 3y = 7$  and containing the point  $(5,1)$

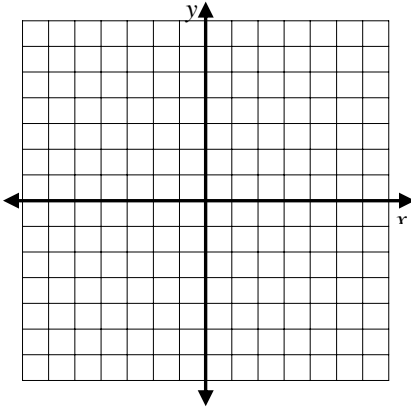
e) perpendicular to the line  $-3y + 6x = 2$  and containing the point  $(4,3)$

13) For each function, make a neat sketch, including a scale or numbering of the axes. Name the domain and range for each as well. (Remember – no calculator!)

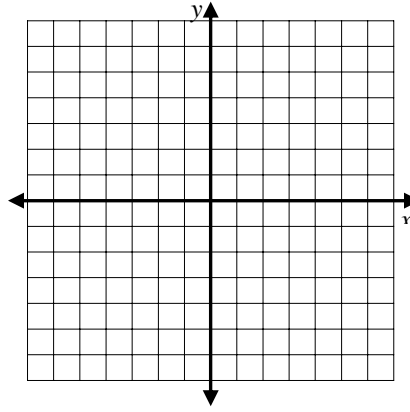
a)  $y = \sqrt{x}$

b)  $y = \sqrt[3]{x}$

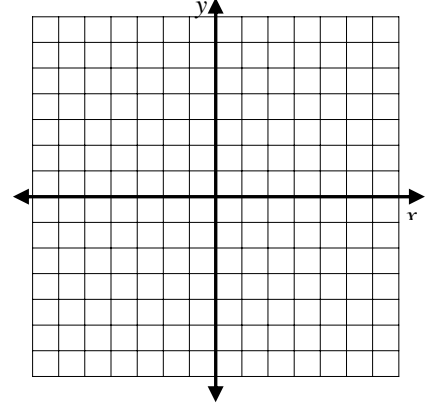
c)  $y = e^x$



D:  
R:



D:  
R:

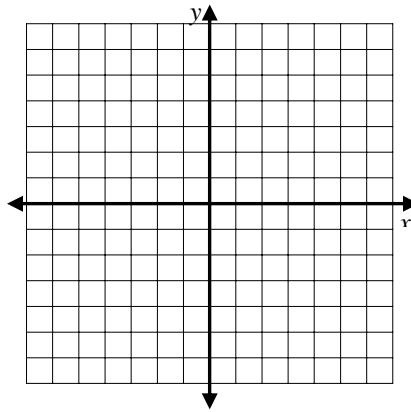


D:  
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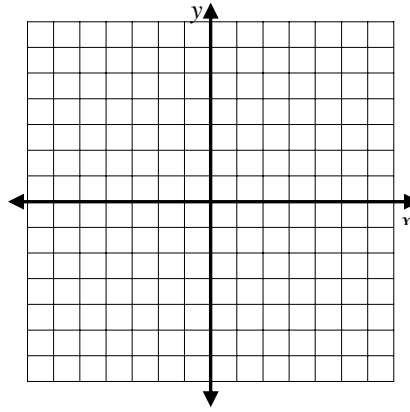
d)  $y = \ln x$

e)  $y = 2^x$

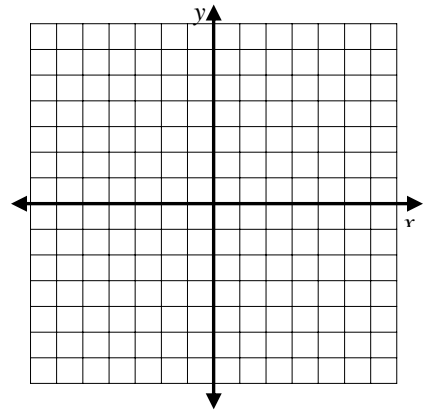
f)  $y = 1/x$



D:  
R:



D:  
R:

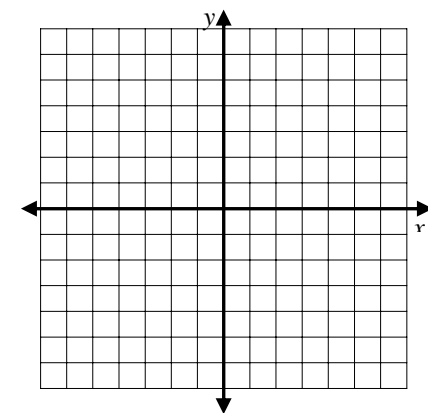
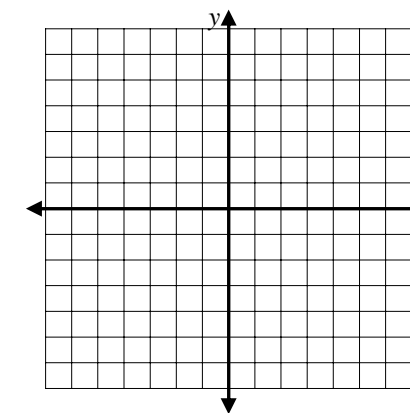
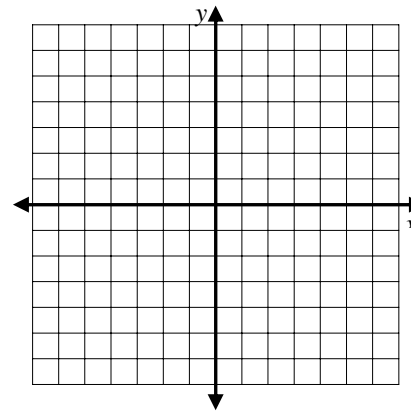


D:  
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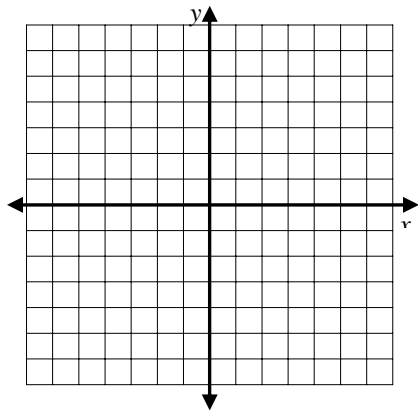
g)  $y = x^2 - 4$

h)  $y = x^2 + 4x + 3$

i)  $y = \sin x$

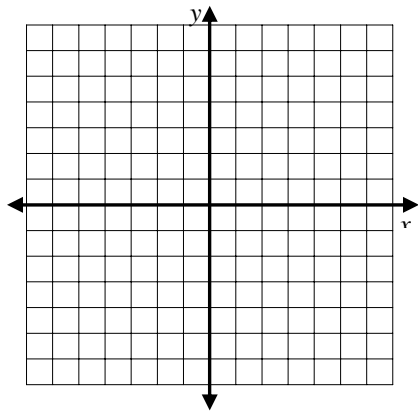


j)  $y = \sqrt{x-2}$



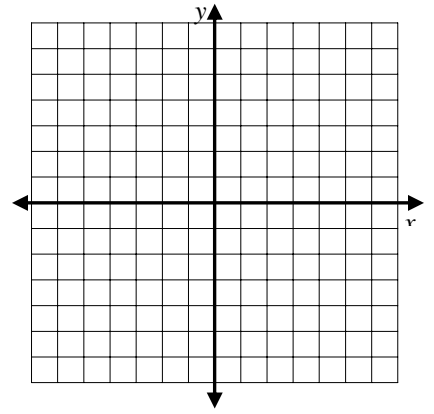
D:  
R:

k)  $y = \sqrt{4-x^2}$



D:  
R:

l)  $y = |x+3| - 2$



D:  
R: