Mathematics Worksheet for Incoming Students Trinity Pawling Level 2

Name: _____ Entering Grade: _____

Please complete this worksheet in one (1) hour or less. This assessment is meant to help us place you in the appropriate Mathematics course. As such, these questions will be of different levels of difficulty – some questions will require about 30 seconds or less.

A calculator *should not* be necessary to complete these problems.

Please show all of your work for each problem -- even the multiple choice questions.

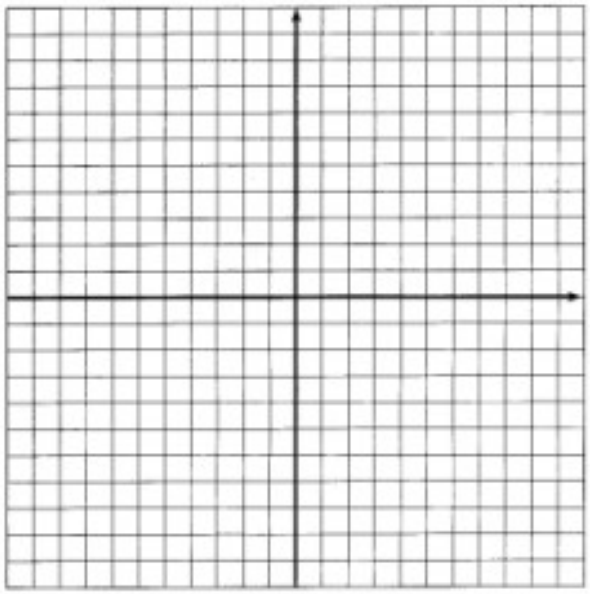
1) Evaluate $f(x) = 3x^2 - 2x + 7$ when $x = -4$.

2) Tell whether lines passing through the following pairs of points are *parallel, perpendicular* or *neither.*

Line 1: through (2, 10) and (1, 5)

Line 2: through (3, -7) and (8, -8)

3) Graph: $2y - 3x = -12$.



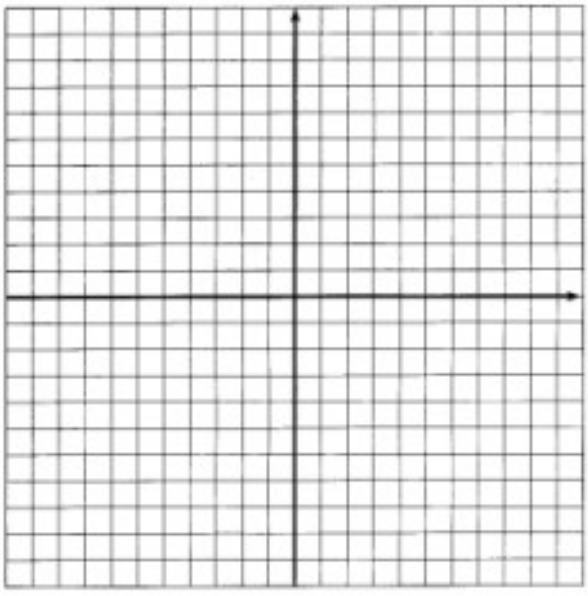
4) Solve: $\frac{1}{3}(x-4)^2 = 3$

5) Solve: $4x^2 + x = 3$

6) Simplify: $\dfrac{(-2x^{-2}y^{3})^{-1}z^{2}}{-4xy^{2}z^{-4}}$

7) Write in simplest form: $\sqrt{32x^{6}y^{10}z^{9}}$

8) Graph: $y = \sqrt{x+5}$. State the domain and range.



9) The variables x and y vary inversely. If $x = 5$ when $y = 4$, find x when $y = -10$.

10) Solve: $\frac{3}{x+4} = \frac{9}{x-2}$

11) Solve: $\frac{3x}{x+1} + \frac{6}{2x} = \frac{7}{x}$

12) Simplify: $\dfrac{8x-1}{x^2+x-6}-\dfrac{4}{x-2}$

13) Simplify: $\dfrac{x^2-9}{5x+10}\div\dfrac{x-3}{5x^2-20}$

14) Simplify: $\dfrac{\dfrac{10}{x+1}}{\dfrac{1}{2}+\dfrac{3}{x+1}}$

15) _____

Multiple Choice What is the solution of $4^{4x} = 16^{x+1}$?

(A) 0 (B) 1 (C) 2

(D) 3 (E) 4

16) _____

Multiple Choice What is the solution of $\log_7 (4x + 5) = 2$?

(A) 2 (B) 6 (C) 9

(D) 11 (E) 14

17) _____

Multiple Choice What is the condensed expression for $2 \ln x + \ln 3$?

(A) $3 \ln x^2$ (B) $\ln \frac{x^2}{3}$

(C) $\ln 3x^2$ (D) $\ln \frac{3}{x^2}$

(E) $x^2 \ln 3$

18) _____

Multiple Choice Which of the following is equivalent to $\log \frac{x^2y^3}{z^4}$?

(A) $6 \log xy - 4 \log z$

(B) $2 \log x - 3 \log y + 4 \log z$

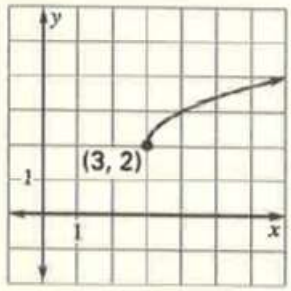
(C) $2 \log x + 3 \log y + 4 \log z$

(D) $2 \log x + 3 \log y - 4 \log z$

(E) $3 \log y - 2 \log x - 4 \log z$

19) _____

Multiple Choice Which function is graphed?



(A) $y = \sqrt{x + 3}$

(B) $y = \sqrt{x - 3} + 2$

(C) $y = \sqrt{x - 3} - 2$

(D) $y = \sqrt{x + 3} - 2$

(E) $y = \sqrt{x - 3}$

20) _____

Multiple Choice Which function is the inverse of $f(x) = \frac{1}{4}x^3 + 1$?

(A) $f^{-1}(x) = \sqrt[3]{4x}$

(B) $f^{-1}(x) = \sqrt[3]{x - 1}$

(C) $f^{-1}(x) = \sqrt[3]{4x - 4}$

(D) $f^{-1}(x) = \sqrt[3]{4x - 1}$

(E) $f^{-1}(x) = \sqrt[3]{4x + 4}$

21) Let $f(x) = 4x - 8$ *and* $g(x) = x - 2$. Evaluate :

a) $f(x) + g(x)$

b) $\frac{f(x)}{g(x)}$