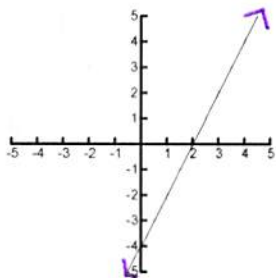


Review Worksheet for Unit 3 Test #1

Name KEY Class Period _____

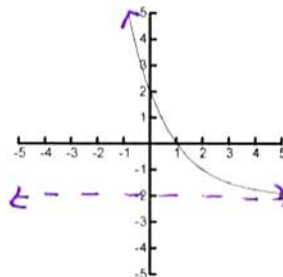
For each of the functions find the following characteristics.

1.



Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 x-intercept(s): $(2, 0)$
 y-intercept(s): $(0, -4)$
 Interval of Increase: $(-\infty, \infty)$
 Interval of Decrease: none
 Maximum Point: none
 Minimum Point: none
 End Behavior: $x \rightarrow \infty, y \rightarrow \infty$
 $x \rightarrow -\infty, y \rightarrow -\infty$

2.



Domain: $(-\infty, \infty)$
 Range: $(-2, \infty)$
 x-intercept(s): $(1, 0)$
 y-intercept(s): $(0, 2)$
 Interval of Increase: none
 Interval of Decrease: $(-\infty, \infty)$
 Maximum Point: none
 Minimum Point: none
 End Behavior: $x \rightarrow \infty, y \rightarrow -2$
 $x \rightarrow -\infty, y \rightarrow \infty$

Function Notation. Find the following using the three given functions.

$$f(x) = 2x - 4$$

$$g(x) = x^3 - 8$$

$$h(x) = x^2 - 3x$$

3. $g(6)$

$$g(6) = (6)^3 - 8$$

$$g(6) = 208$$

4. $h(-2)$

$$h(-2) = (-2)^2 - 3(-2)$$

$$= 4 + 6$$

$$h(-2) = 10$$

5. $f(5x+6)$

$$f(5x+6) = 2(5x+6) - 4$$

$$= 10x + 12 - 4$$

$$f(5x+6) = 10x + 8$$

6. $3g(x)$

$$3g(x) = 3(x^3 - 8)$$

$$3g(x) = 3x^3 - 24$$

7. $2h(x) + 4g(x)$

$$2h(x) + 4g(x) =$$

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

$$2x^2 - 6x + 4x^3 - 32$$

$$4x^3 + 2x^2 - 6x - 32$$

8. $f(x) - h(x)$

$$f(x) - h(x) =$$

$$2x - 4 - (x^2 - 3x)$$

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

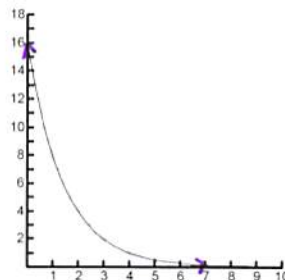
$$-x^2 + 5x - 4$$

Use the graph to answer the following.

9. $f(2) = 4$

10. $f(4) = 1$

11. $f(1) = 8$

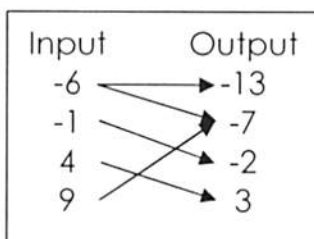


Determine whether the relation is a function. If it is a function, state the domain and range.

12. $\{(-3,0), (4,1), (-3,2)\}$

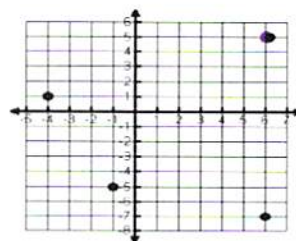
Not a function

13.



Not a function

14.



Not a function

Find the rate of change.

15. $(6,-3), (8,-2)$

$$\frac{-2 - (-3)}{8 - 6} = \frac{1}{2}$$

$$\frac{y_2 - y_1}{x_2 - x_1}$$

16. $f(x) = -2x + 4$, when $x_1 = 2$ and $x_2 = -3$.

$(2, 0) \quad f(2) = -2(2) + 4$

$(-3, 10) \quad f(-3) = -2(-3) + 4$

$$\frac{10 - 0}{-3 - 2} = \frac{10}{-5} = -2$$

17. From 2 years to 4 years.

t (Years)	1	2	3	4
f(t)	4	8	10	16

$(2, 8)$

$(4, 16)$

$$\frac{16 - 8}{4 - 2} = \frac{8}{2} = 4$$

18. $g(x) = 3x - 2$ when $x_1 = 0$ and $x_2 = 4$.

$(0, -2) \quad g(0) = 3(0) - 2$

$(4, 10) \quad g(4) = 3(4) - 2$

$$\frac{10 - (-2)}{4 - 0} = \frac{12}{4} = 3$$

Sequences

19. Write an **explicit** rule for the nth term. Then find a_{50} . 1, 5, 9, 13, ...

$$a_n = 4n - 3$$

$$a_{50} = 197$$

20. Write an **explicit** rule for the nth term. Then find a_8 . 8, 16, 32, 64, ...

$$a_n = 8(2)^{n-1}$$

$$a_8 = 1024$$

21. Write an **explicit** rule for the nth term. Then find a_{16} . 12, 6, 0, -6, ...

$$a_n = -6n + 18$$

$$a_{16} = -78$$

22. Write an **explicit** rule for the nth term. Then find a_{22} . -1, 5, -25, 125, ...

$$a_n = -1(-5)^{n-1}$$

$$a_{22} = 4.77 \times 10^{14}$$

Comparing Functions

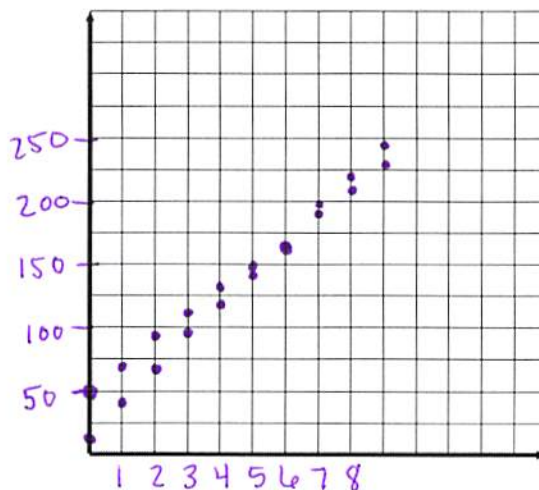
23. Tim and Tom are twins. They both want to become good free throw shooters. They each devise a separate workout plan to get better at shooting free throws. Tim is going to start with 50 shots and increase by 20 each day. Tom is going to start with 20 shots and increase by 25 each day.

a) Write a function for each person.

Tim: $T(x) = 20x + 50$

Tom: $M(x) = 25x + 20$

b) Graph the functions below.



c) At what point is Tom shooting more free throws than Tim. Justify your answer algebraically.

$(6, 170)$

This is the point where Tom & Tim shoot the same amount of free-throws in 1 day.

$T(6) = 50 + 20(6)$ $M(6) = 20 + 25(6)$
 $T(6) = 170$ $M(6) = 170$

Simplify the expressions.

24. $\left(\frac{3}{4}\right)^{-3}$

$\frac{3^{-3}}{4^{-3}} = \frac{4^3}{3^3} = \frac{64}{27}$

25. $(15a^3b^4)^2$

$15^2 a^6 b^8$
 $225a^6b^8$

26. x^{-2}

$\frac{1}{x^2}$

$\frac{125}{a^6 b^6}$

$\frac{125a^9b^6}{a^{15}b^{12}}$

27. $\frac{m^5n^{-2}}{m^3n}$

m^2n^{-3}
 $\frac{m^2}{n^3}$

28. $(-3x^3y^2)^3 \cdot (2xy^5)$

$(-3)^3 x^9 y^6 \cdot 2xy^5$
 $-27x^9y^6 \cdot 2xy^5$
 $-54x^{10}y^{11}$

29. $\left(\frac{5a}{b^4}\right)^3 \cdot \left(\frac{a^5b^{-2}}{a^2}\right)^{-3}$

$\frac{5^3 a^3}{b^{12}} \cdot \frac{a^{-15} b^6}{a^6} = \frac{125a^3}{b^{12}} \cdot \frac{a^6 b^6}{a^{15}}$

30. $k(8k + 3) + (k + 7k)$

$8k^2 + 3k + k + 7k$
 $8k^2 + 11k$

31. $-7(x^2 + 2) - 6x(3x + 1)$

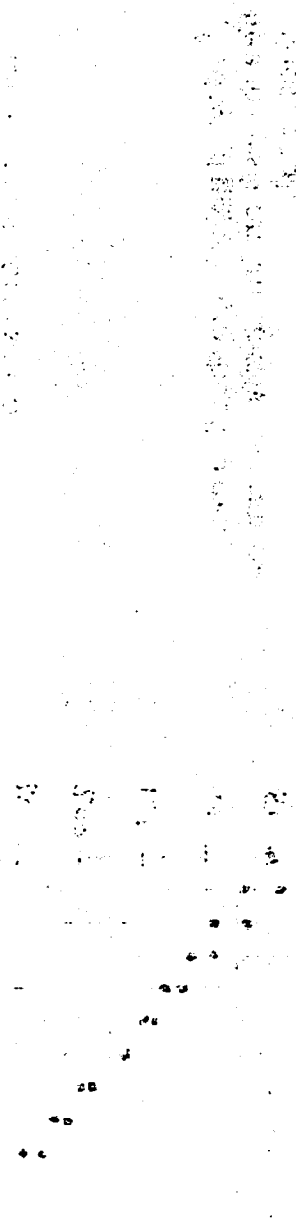
$-7x^2 - 14 - 18x^2 - 6x$
 $-25x^2 - 6x - 14$

32. $5y(y^2 + 4y - 6) + y(y + 3)$

$5y^3 + 20y^2 - 30y + y^2 + 3y$
 $5y^3 + 21y^2 - 27y$

$1000 \times 0.05 = 50$
 $1000 \times 0.05 = 50$
 $1000 \times 0.05 = 50$

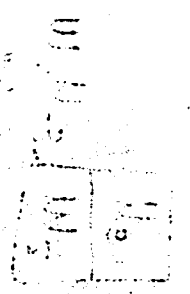
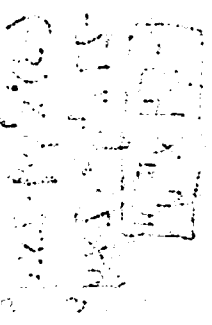
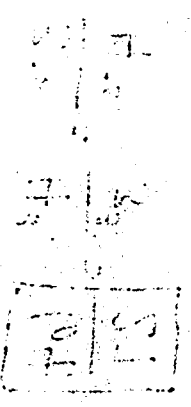
$1000 \times 0.05 = 50$
 $1000 \times 0.05 = 50$



(0.05)

This is the first part of the problem.

The next part of the problem is...



This is the next part of the problem.

This is the next part of the problem.

This is the next part of the problem.

This is the next part of the problem.