Pre-AP Algebra II

Name Mr. Solis

Period ___ Date _____

Review Unit 1: Survey of Functions

Determine whether the ordered pairs and equations represent functions. Explain your answers.

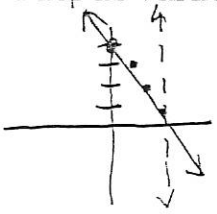
1. $\{(5, 4), (6, 3), (7, 2)\}$

Yes ⇒ every x has only one y

2. $\{(4, 5), (4, 3), (5, 2)\}$

No ⇒ x value of 4 has two different y value.

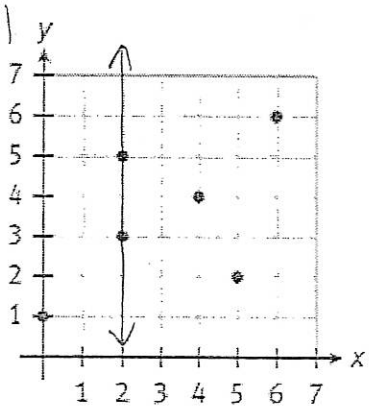
3. $y = -x + 4$, where x represents input values and y represents output values



yes, passes the vertical line test (only touches once)

4. Does the graph shown represent a function? Explain.

No, applying the vertical line test @ x=2 fails b/c it crosses through 2 points



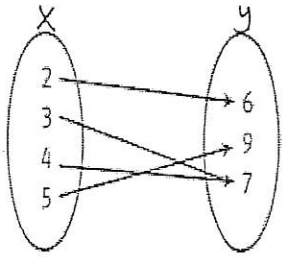
5. State the domain and range of #4.

Domain $\{0, 2, 4, 5, 6\}$

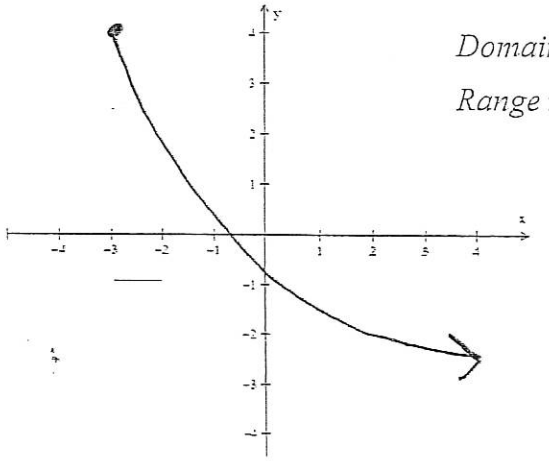
Range $\{1, 2, 3, 4, 5, 6\}$

6. Does the mapping shown represent a function? Explain.

Yes, every x value only goes to one y value.



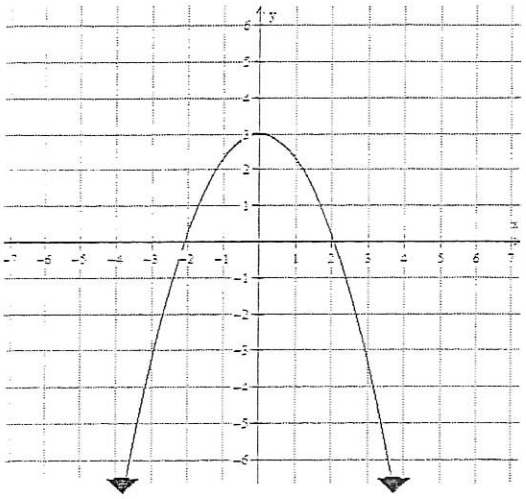
7. Sketch a continuous FUNCTION using the provided domain and range.



Domain: $[-3, \infty)$

Range: $(-\infty, 4]$

8. Identify the domain and range in inequality and interval notation



Domain: $-\infty < x < \infty$

$(-\infty, \infty)$

Range $-\infty < y \leq 3$

$(-\infty, 3]$

Circle One: (Function) or NOT a Function

Circle One: (Continuous) or Discrete

Evaluate the following problems given the two functions below. Leave answers as improper fractions.

$f(x) = x^2 - 2x + 3$

$g(x) = -\frac{2}{3}x - 4$

9. $f\left(\frac{2}{7}\right) = \left(\frac{2}{7}\right)^2 - 2\left(\frac{2}{7}\right) + 3$

$\frac{4}{49} - \frac{4 \cdot 7}{7 \cdot 7} + \frac{3 \cdot 49}{1 \cdot 49}$

$\frac{4}{49} - \frac{28}{49} + \frac{147}{49} = \boxed{\frac{123}{49}}$

10. $g\left(\frac{9}{4}\right) = -\frac{2}{3}\left(\frac{9}{4}\right) - 4$

$-\frac{3}{2} - \frac{4 \cdot 2}{1 \cdot 2}$

$-\frac{3}{2} - \frac{8}{2} = \boxed{\frac{-11}{2}}$

11. $f\left(\frac{1}{5}\right) = \left(\frac{1}{5}\right)^2 - 2\left(\frac{1}{5}\right) + 3$

$\frac{1}{25} - \frac{2 \cdot 5}{5 \cdot 5} + \frac{3 \cdot 25}{1 \cdot 25}$

$\frac{1}{25} - \frac{10}{25} + \frac{75}{25} = \boxed{\frac{66}{25}}$

12. $g\left(\frac{6}{5}\right) = -\frac{2}{3}\left(\frac{6}{5}\right) - 4$

$-\frac{4}{5} - \frac{4 \cdot 5}{1 \cdot 5}$

$-\frac{4}{5} - \frac{20}{5} = \boxed{\frac{-24}{5}}$

13. Write an equation that shifts the graph 4 units right, shrinks vertically by a half, shrinks horizontally by a factor of 3. The entire graph should be shifted up 5 units and reflects over the x- axis.

$G(x) = -\frac{1}{2} f 3 (X - 4) + 5$

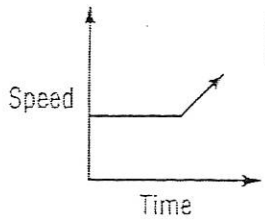
$a = -\frac{1}{2}$

$b = 3$

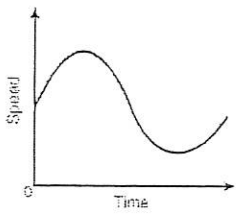
14. Match the description to the graph:

Debby took from a stoplight and rapidly increased her speed until she saw another stoplight. When she saw the next stoplight, she braked and slowed down. As she approached the light, it turned green so she increased her speed again. Do you see a flaw in the correct answer?

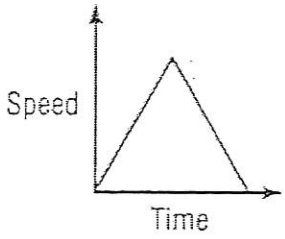
a.



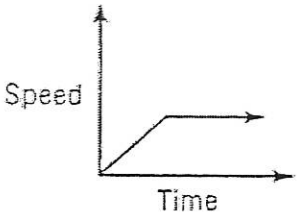
b.



c.



d.



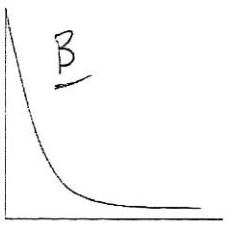
15. Match each of the following descriptions with an appropriate graph.

a. The weight of your jumbo box of cereal decreases by an equal amount every week.

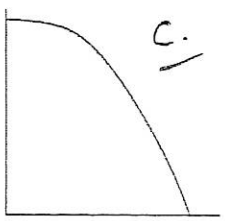
b. The value of the bicycle depreciated rapidly at first, but its value declined more slowly as time went on.

c. The tennis ball is dropped off the roof of a skyscraper.

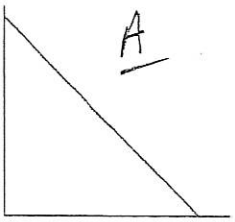
i.



ii.



iii.



16. Write a full description of the transformations.

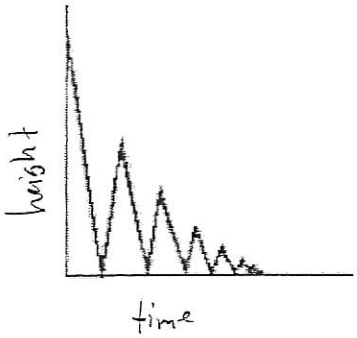
a a "-" reflects over x-axis, vertical stretch if $a>1$, vertical shrink if $0<a<1$

b a "-" reflects over y-axis, horizontal stretch if $0<b<1$, horizontal shrink if $b>1$

H horizontal shift (opposite of sign)

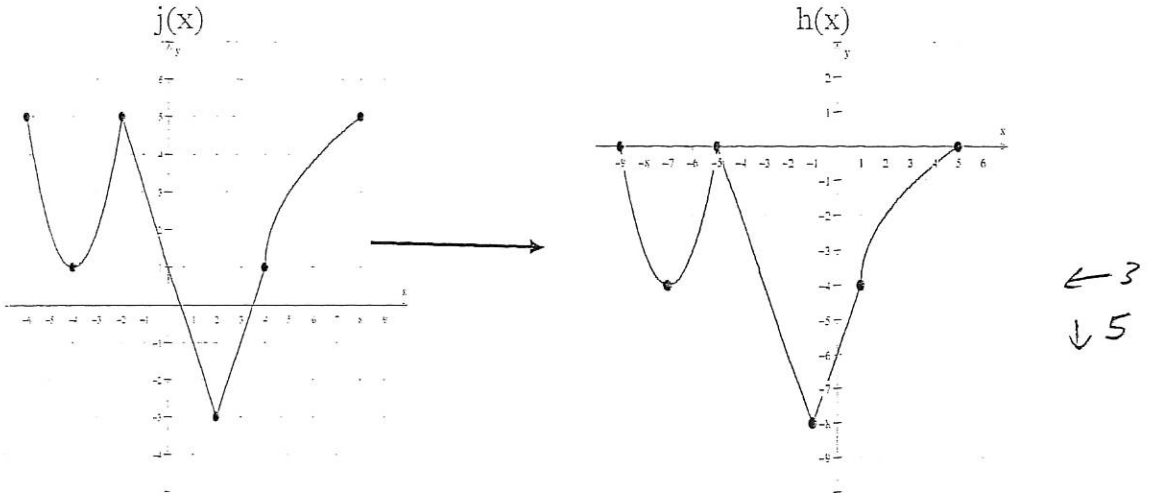
K vertical shift (same as sign)

17. Write a story that would fit the given graph.



Celebrating the awesome test scores in Mr. Soli's Algebra II Pre-Ap class, he jumped off the 3rd floor of the 8000 building onto a trampoline. The graph to the left illustrates the path of his fall on the way down and also as he bounces up & down until he comes to a complete stop.

18. Fill in the blanks for the correct transformations. h(x) = ____ j(x +3) -5
(Not all blanks have to be used.)



Simplify the following.

19. $\frac{5+8\cdot4}{8(5-4)-3} = \frac{37}{5}$

$= \frac{5+32}{8(1)-3}$

$= \frac{37}{5}$

20. $\frac{-2^2+(-3)^2-4^2}{(-2)^2+-3^2} = \frac{11}{5}$

$= \frac{-4+9-16}{4-9}$

$= \frac{-11}{-5}$

$= \frac{11}{5}$

21. $4^2 - \frac{6-3\cdot4}{2(3-5)} - 2 = \frac{25}{2}$

$16 - \frac{6-12}{2(-2)} - 2$

$16 - \frac{-6}{-4} - 2$

$16 - \frac{6\div2}{4\div2} - 2$

$2\cdot\frac{16}{2\cdot1} - \frac{3}{2} - \frac{2\cdot2}{1\cdot2}$

$\frac{32}{2} - \frac{3}{2} - \frac{4}{2} = \frac{25}{2}$

Solve the following.

22. $\frac{2}{5}x - 1 = \frac{1}{3}(x+6)$

$\frac{2}{5}x - 1 = \frac{1}{3}x + 2$

$+1 \quad +1$

$\frac{2}{5}x = \frac{1}{3}x + 3$

$-\frac{1}{3}x \quad -\frac{1}{3}x$

$\frac{2\cdot3}{5\cdot3}x - \frac{1\cdot5}{3\cdot5}x = 3$

$\frac{6}{5}x - \frac{5}{15}x = 3$

$15 \cdot \frac{1}{15}x = 3 \cdot 15$

$x = 45$

23. $-13 = 5(1+4m) - 2m$

$-13 = 5 + 20m - 2m$

$-5 \quad -5$

$\frac{-18}{18} = \frac{18m}{18}$

$m = -1$

24. $-5n - 8(1+7n) = -8$

$-5n - 8 - 56n = -8$

$+8 \quad +8$

$\frac{-61n}{-61} = \frac{0}{-61}$

$n = 0$

25. $5(2x+6) = -4(-5-2x) - 3x$

change to minus sign

$10x + 30 = 20 + 8x - 3x$

$-20 \quad -20$

$10x + 10 = 5x$

$-10x \quad -10x$

$\frac{10}{5} = \frac{-5x}{-5}$

$x = -2$

26. $\frac{3}{4}(2x+1) = 2$

$\frac{3}{2^1 4} \cdot \frac{8x}{1} + \frac{3}{4} \cdot \frac{1}{1} = 2$

$\frac{3x}{2} + \frac{3}{4} = 2$

$-\frac{3}{4} \quad -\frac{3}{4}$

$\frac{3}{2}x = \frac{2^4}{1\cdot4} - \frac{3}{4}$

$\frac{3}{2}x = \frac{8}{4} - \frac{3}{4}$

$\frac{2}{3} \cdot \frac{3}{2}x = \frac{5}{4} \cdot \frac{2}{3}$

$x = \frac{10}{12} = \frac{5}{6}$

27. $\frac{1}{2} + \frac{2}{5}t - 1 = \frac{1}{5}t + t$

$-\frac{1}{5}t \quad -\frac{1}{5}t$

$\frac{1}{2} - \frac{1\cdot7}{1\cdot2}\frac{1}{5}t = t$

$\frac{1}{2} - \frac{2}{2} + \frac{1}{5}t = t$

$-\frac{1}{2} + \frac{1}{5}t = t$

$-\frac{1}{5}t \quad -\frac{1}{5}t$

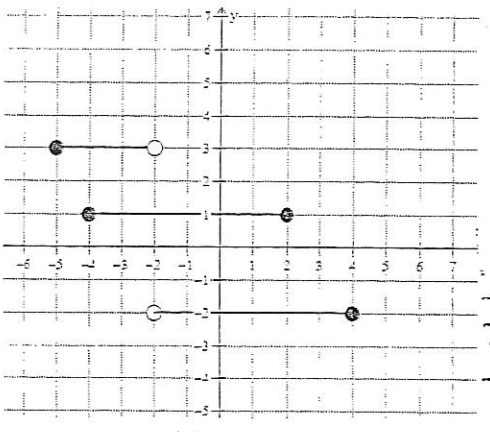
$-\frac{1}{2} = \frac{1\cdot5}{15} - \frac{1}{5}t$

$-\frac{1}{2} = \frac{5t}{5} - \frac{1}{5}t$

$\frac{5}{4}\left(-\frac{1}{2}\right) = \frac{4}{5}t \cdot \frac{5}{4}$

$-\frac{5}{8} = t$

28. What is the correct domain and range of the following relation?



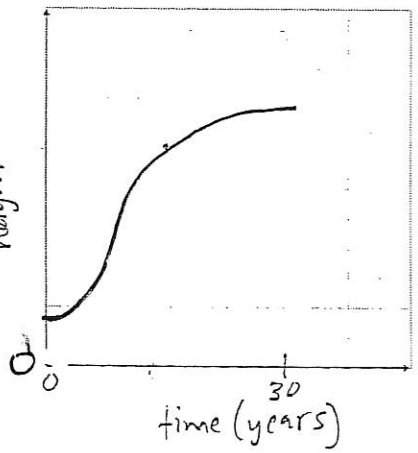
Domain: $[-5, 4]$

Range: $\{-2, 1, 3\}$

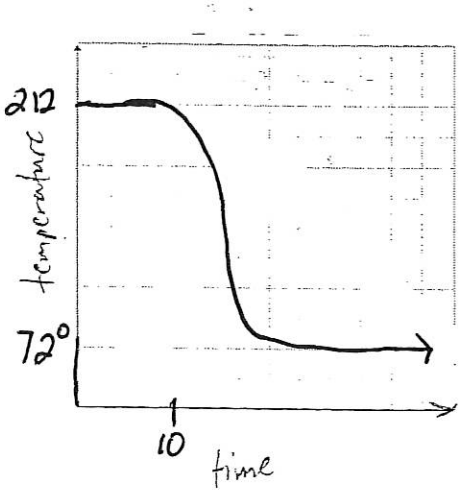
Circle one: Function or Not a Function

Sketch a graph of the following.

29. The height of a person from 0 to 30 years.



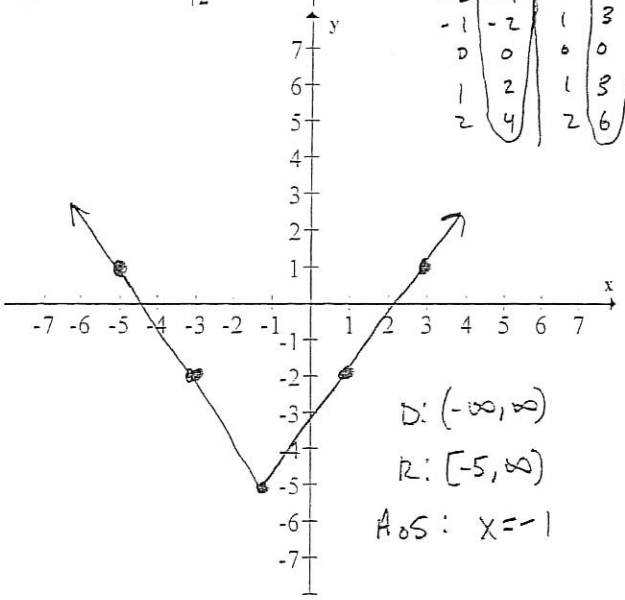
30. The temperature of a pot of boiling water over time. The and then the taken off of the heat.



Graph the following in the space provided.

31) $f(x) = 3\left|\frac{1}{2}(x+1)\right| - 5$

x	2x	y
-2	-4	6
-1	-2	3
0	0	0
1	2	3
2	4	6



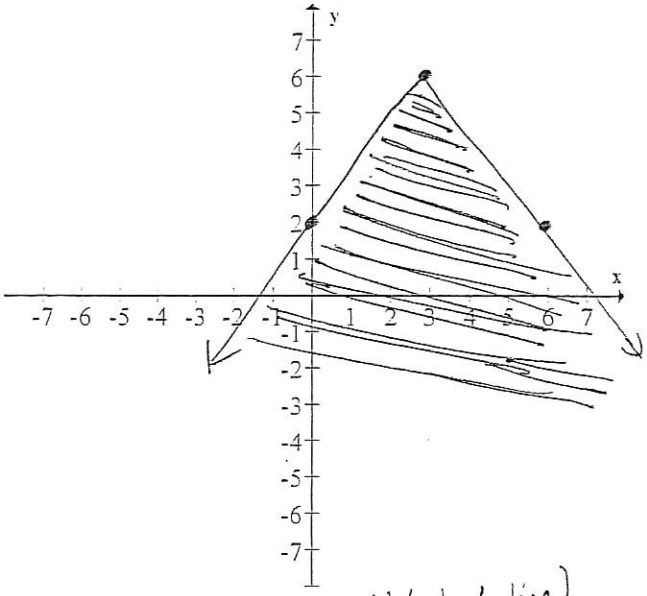
D: $(-\infty, \infty)$

R: $[-5, \infty)$

AoS: $x = -1$

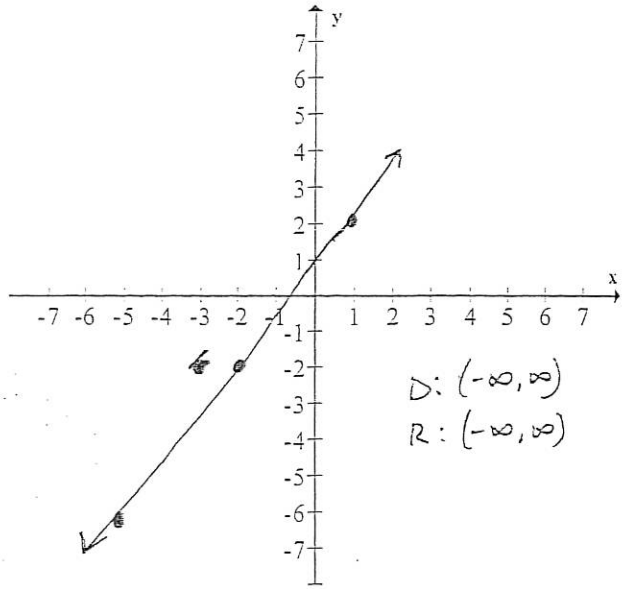
inequality (solid line)

32) $y \leq -\frac{4}{3}|(x-3)| + 6$



inequality (dotted/dashed line)

33) $g(x) = 4\left[\frac{1}{3}(x+5)\right] - 6$



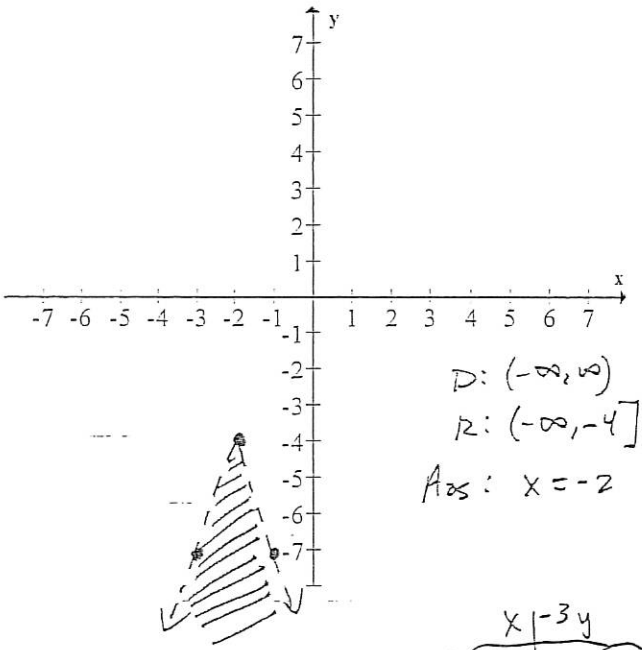
D: $(-\infty, \infty)$

R: $(-\infty, \infty)$

x	3x	y	4y
-2	-6	-2	-8
-1	-3	-1	-4
0	0	0	0
1	3	1	4
2	6	2	8

linear graph

34) $y < -3|(x+2)| - 4$



D: $(-\infty, \infty)$

R: $(-\infty, -4]$

AoS: $x = -2$

graph should be dotted because $<$ not $\leq$

x	-3y
-2	6
-1	3
0	0
1	-3
2	-6