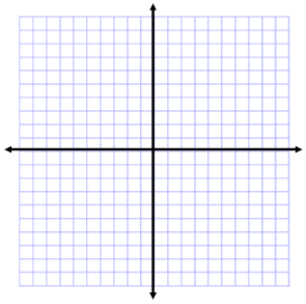
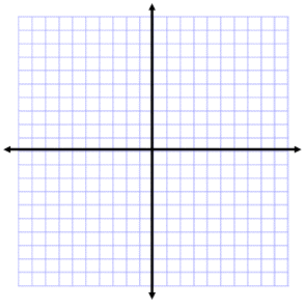
Pre-Calculus **Practice Quiz 5** **Name_____ Pd _____**
Sections: 3-4 to 3-6

Topic 1: Inverse Functions – find the inverse of each of the following functions and graph both.

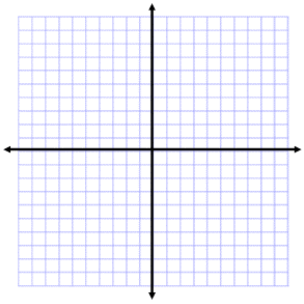
1. $f(x) = 2x - 4$



2. $g(x) = x^2 - 4$



3. $h(x) = x^2 - 6x + 9$

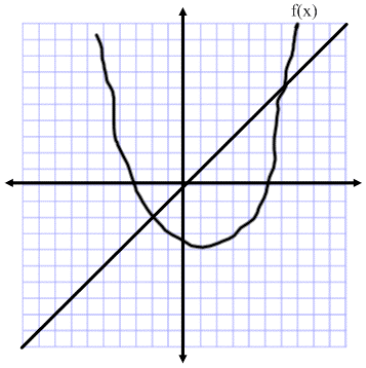


4. f(x) and g(x) are inverse functions, if (-2, 5) is on the graph of f(x), then what point must be on g(x)?

5. $f(x) = (x + b)^2 + c$ has a vertical shift of 2 and a horizontal shift of -5. State the inverse function of f(x) and describe the horizontal and vertical shift of the inverse.

6. f(x) and g(x) are inverse functions of each other. What is the value of f(g(x)) – g(f(x))?

7. sketch the inverse of the graph shown below.



Topic 2: Continuity and End Behavior – state the end behavior of the following functions and describe if the function is continuous at the given x value. If the function is discontinuous, state the type of discontinuity.

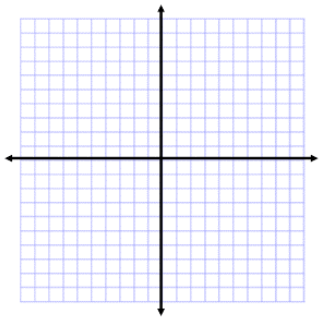
8. $f(x) = \frac{1}{x}$ *at* $x = 0$

9. $f(x) = \frac{x^2 + 3x}{x + 3}$ *at* $x = 0$ *and* -3

10. $f(x) = \begin{cases} 2x - 4 & x < 1 \\ -2x^2 & x \geq 1 \end{cases}$

continuous at $x = 1$?

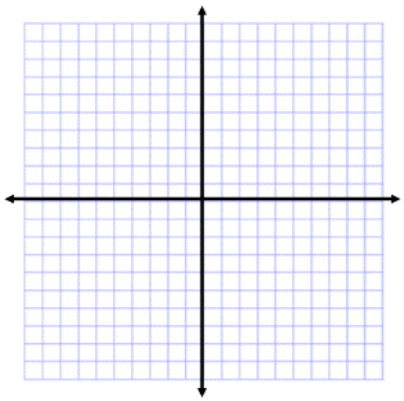
Sketch f(x) →



Topic 3: Increasing and Decreasing – state the intervals on which the following functions are increasing and decreasing and list all local and global extremes.

11. $f(x) = x^2 - 2x + 1$

12. $f(x) = \dfrac{1}{x^2 - 4}$



13. For g(x), find the end behavior, any points of discontinuity, all extremes, the x and y intercepts, and use these values to create a detailed sketch: $f(x) = \dfrac{x(x+2)(x-2)(x+1)}{x+1}$

14. Why does the graph in #13 have a point discontinuity instead of an infinite discontinuity at x = -1?

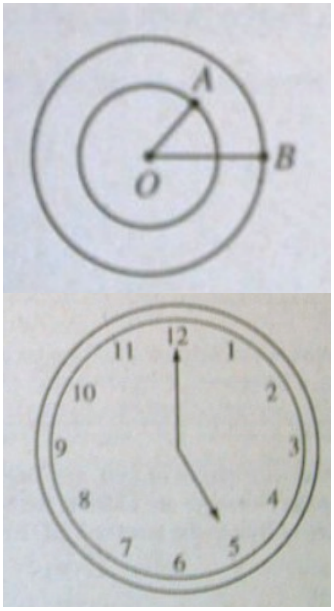
SAT/ACT Questions

1. If 1 roll of tape contains 800 inches of tape, how many FEET of tape are in 6 rolls? (12 inches = 1 foot)

2. A rectangle has length 6 cm and width 2 cm. If both the length and width of the rectangle are doubled, what will be the area of the resulting rectangle in square cm?

4. if $0.0027 = 2.7 \times 10^k$, then k = ?

5. O is the center of both circles shown, OA = 3 and OB = 5. What is the ratio of the circumference of the smaller circle to the circumference of the larger circle?



6. The clock below shows a time of 5:00. What time will it show exactly 125 hours later?

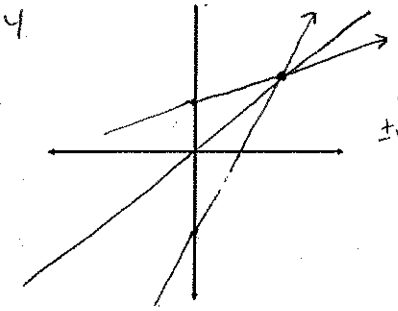
Pre-Calculus Practice Quiz 5 Name________________ Pd ___

Sections: 3-4 to 3-6

Topic 1: Inverse Functions – find the inverse of each of the following functions and graph both.

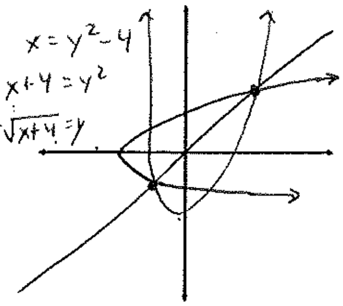
1. $f(x) = 2x - 4$

$x = 2y - 4$
$x + 4 = 2y$
$\frac{1}{2}x + 2 = y$



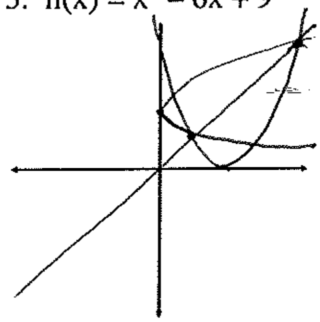
2. $g(x) = x^2 - 4$

$x = y^2 - 4$
$x + 4 = y^2$
$\pm\sqrt{x+4} = y$



3. $h(x) = x^2 - 6x + 9$

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



4. f(x) and g(x) are inverse functions, if (-2, 5) is on the graph of f(x), then what point must be on g(x)?

(5, -2)

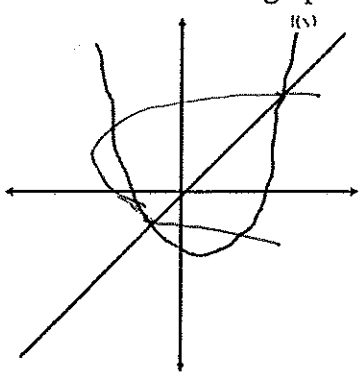
5. $f(x) = (x + b)^2 + c$ has a vertical shift of 2 and a horizontal shift of -5. State the inverse function of f(x) and describe the horizontal and vertical shift of the inverse.

$f(x) = (x + -5)^2 + 2$ $x = (y-5)^2 + 2$ $\sqrt{x-2} = y - 5$ $y = 5 \pm \sqrt{x-2}$

6. f(x) and g(x) are inverse functions of each other. What is the value of f(g(x)) – g(f(x))?

$x - x = 0$

7. sketch the inverse of the graph shown below.



Topic 2: Continuity and End Behavior – state the end behavior of the following functions and describe if the function is continuous at the given x value. If the function is discontinuous, state the type of discontinuity.

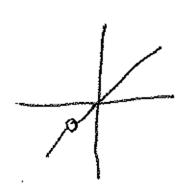
8. $f(x) = \frac{1}{x}$ $at\ x = 0$ no - inf

$x \to -\infty$ $y \to 0$
$x \to \infty$ $y \to 0$

9. $f(x) = \frac{x^2 + 3x}{x + 3}$ $at\ x = 0\ and\ -3$ Yes no - point

$x(x+3)$

$x \to \infty$ $y \to \infty$
$x \to -\infty$ $y \to -\infty$

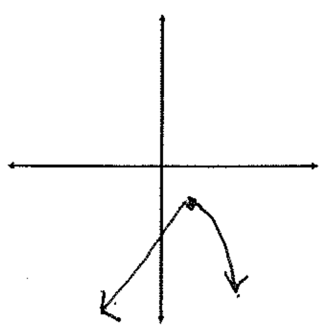


10. $f(x) = \begin{cases} 2x - 4 & x < 1 \\ -2x^2 & x \geq 1 \end{cases}$

continuous at $x = 1$?

Yes

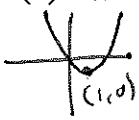
Sketch f(x) →



$x \to \infty$ $y \to -\infty$
$x \to -\infty$ $y \to -\infty$

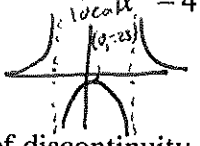
Topic 3: Increasing and Decreasing – state the intervals on which the following functions are increasing and decreasing and list all local and global extremes.

11. $f(x) = x^2 - 2x + 1$

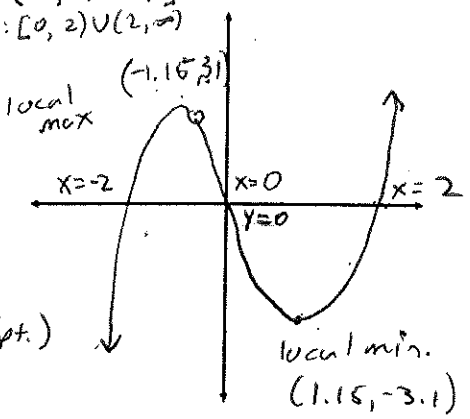


Dec: $(-\infty, 1]$
Inc $[1, \infty)$

12. $f(x) = \frac{1}{x^2 - 4}$



INC: $(-\infty, -2) \cup (-2, 0]$
DEC: $[0, 2) \cup (2, \infty)$



13. For g(x), find the end behavior, any points of discontinuity, all extremes, the x and y intercepts, and use these values to create a detailed sketch: $f(x) = \frac{x(x+2)(x-2)(x+1)}{x+1}$

$x \to \infty, y \to \infty$
$x \to -\infty, y \to -\infty$

Discon at $x = -1$ (pt.)

14. Why does the graph in #13 have a point discontinuity instead of an infinite discontinuity at x = -1?

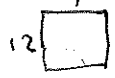
Because $x = -1$ is a red flag we can eliminate.

SAT/ACT Questions

1. If 1 roll of tape contains 800 inches of tape, how many FEET of tape are in 6 rolls? (12 inches = 1 foot)

$800/12 = 66.\overline{6}$ feet $\times 6 \approx 400$ ft.

2. A rectangle has length 6 cm and width 2 cm. If both the length and width of the rectangle are doubled, what will be the area of the resulting rectangle in square cm?

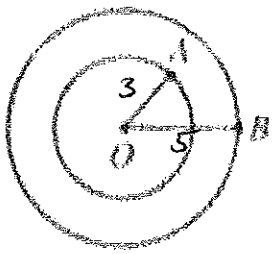


48 cm^2

4. if $0.0027 = 2.7 \times 10^k$, then k = ? $k = -3$

3

5. O is the center of both circles shown, OA = 3 and OB = 5. What is the ratio of the circumference of the smaller circle to the circumference of the larger circle?



$C_1 = 2 \cdot 3\pi = 6\pi$

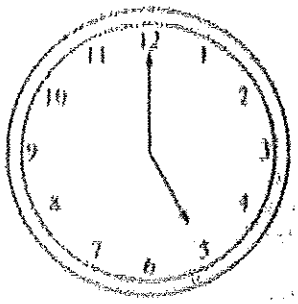
$C_2 = 2 \cdot 5\pi = 10\pi$

ratio: $\frac{6\pi}{10\pi} = \frac{3}{5}$

6. The clock below shows a time of 5:00. What time will it show exactly 125 hours later?

-120
5

10:00



Notebook Check:

Homework Check:
