Hon Pre-Calc

Hon Pre Calculus
Quiz 1.1 - 1.4

Name _____

Show All Work!!! Circle All Final Answers!!! NO Calculators!!!

Short Answer

1. Use **interval notation** to write the **domain** of the following:

   a) $y = \frac{1}{x} - \frac{3}{x+2}$

   b) $f(s) = \frac{\sqrt{s-1}}{s-4}$

2. Write the **standard form** of the equation of a circle with its diameter endpoints at (-4,-1) and (4 1).

3. A sub shop purchases a used pizza oven for $875. After 5 years, the oven will have to be replaced. Write a linear equation in **slope intercept form** giving the value V of the equipment during the 5 years it will be in use.

4. Determine the quadrant(s) in which (x,y) is located so that the conditions are satisfied.

   a) $xy > 0$

   b) $-x < 0$ and $-y > 0$

5. Find the equation of the line perpendicular to the ***x*-axis** passing through the point (6,-1).

6. Determine whether the lines passing through the points are parallel, perpendicular, or neither:

a) $l_1:(0,-1),(5,9)$

$l_2:(0,3),(4,1)$

b) $l_1:(3,6),(-6,0)$

$l_2:(0,-1),\left(5,\frac{7}{3}\right)$

7. Consider the following piecewise definition:

$$f(x)=\begin{cases}4-5x, & x\le -2\\ 0, & -2<x<2\\ x^2+1, & x\ge 2\end{cases}$$

Find:

a) $f(-2)$

b) $f(2)$

c) $f(0)$

8. Find the **average rate of change function** using the difference quotient for the following function: **(Completely simplify)**

$f(x)=x^3-x+1$

9. Find the **average rate of change function** using the difference quotient for the following function: **(Rationalize the numerator and completely simplify)**

$f(x)=5\sqrt{x+1}$

10. Using the points $A(5,1), B(-1,1), C(-2,0)$,

a) Write the equation of the perpendicular bisector of $\overline{BC}$ in ***point slope*** form.

b) Find the location of the center of the circle that contains the three points.

c) Find the ***exact*** area of the circle.

11. Find the ***x and y*** intercepts of the graphs of:

a) $y^2 = x + 1$

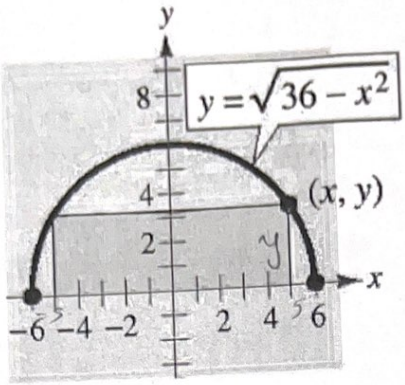
b) $y = -|x + 10|$

12. Use algebra tests to describe the symmetry of the following:

a) $x - y^2 = 0$

b) $xy = 4$

13. A rectangle is bounded by the x-axis and the semicircle $y = \sqrt{36 - x^2}$ (see figure).



a) Write the area A of the rectangle as a function of x.

b) Determine the domain in interval notation.

14. Considering what you know about functions:

a) Give an example of a relation that is a function but not one to one.

b) Give an example of a relation that is **not** a function.

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Quiz 1.1 - 1.4

Name _____ 45/50

Show All Work!!! Circle All Final Answers!!! NO Calculators!!!

Short Answer

1. Use **interval notation** to write the **domain** of the following:

a) $y = \frac{1}{x} - \frac{3}{x+2}$

$x \neq 0,\ x \neq (-2)$

$(-\infty, -2) \cup (-2, 0) \cup (0, \infty)$

b) $f(s) = \frac{\sqrt{s-1}}{s-4}$

$s \neq 4$

$s \geq 1$

$[1, 4) \cup (4, \infty)$

2. Write the **standard form** of the equation of a circle with its diameter endpoints at (-4,-1) and (4,1).

$M\left(\frac{4-4}{2}, \frac{1-1}{2}\right) = M(0,0)$

$d = \sqrt{(4-0)^2 + (1-0)^2}$

$d = \sqrt{4^2 + 1^2}$

$d = \sqrt{17}$

$x^2 + y^2 = 17$

3. A sub shop purchases a used pizza oven for $875. After 5 years, the oven will have to be replaced. Write a linear equation in **slope intercept form** giving the value V of the equipment during the 5 years it will be in use.

$(0, 875)\ (5, 0)$

$m = \frac{875 - 0}{0 - 5} = \frac{875}{-5} = -175$

$y = (-175)x + 875$

4. Determine the quadrant(s) in which (x,y) is located so that the conditions are satisfied.

a) $xy > 0$

I, III

b) $-x < 0$ and $-y > 0$

$x > 0,\ y < 0$ $(+, -)$

IV

5. Find the equation of the line perpendicular to the ***x*-axis** passing through the point (6,-1).

$x = 6$

-1

6. Determine whether the lines passing through the points are parallel, perpendicular, or neither:

a) $l_1:(0,-1),(5,9)$ $\quad m_2 = \frac{3-1}{0-4} = \frac{2}{-4} = -\frac{1}{2}$

$l_2:(0,3),(4,1)$ $\quad m_1 = \frac{-1-9}{0-5} = \frac{-10}{5} = 2$

Perpendicular

b) $l_1:(3,6),(-6,0)$ $\quad m_1 = \frac{6-0}{3+6} = \frac{6}{4} = \frac{2}{3}$

$l_2:(0,-1),\left(5,\frac{7}{3}\right)$ $\quad m_2 = \frac{-\frac{3}{3}-\frac{7}{3}}{0-5} = \frac{-\frac{10}{3}}{-5}$

Neither, 2 $\quad -\frac{10}{3}\times\frac{1}{5} = -\frac{2}{3}$

7. Consider the following piecewise definition:

$$f(x) = \begin{cases} 4-5x, & x \le -2 \\ 0, & -2 < x < 2 \\ x^2+1, & x \ge 2 \end{cases}$$

Find:

a) $f(-2) = 14$ $\quad f(-2) = 4-5(-2)$, $f(-2) = 4+10$, $f(-2) = 14$

b) $f(2) = 5$ $\quad f(2) = 2^2+1$, $f(2) = 4+1$, $f(2) = 5$

c) $f(0) = 0$ $\quad f(0) = 0$

8. Find the **average rate of change function** using the difference quotient for the following function: **(Completely simplify)**

$f(x) = x^3 - x + 1$

$$\frac{(x+h)^3-(x+h)+1-x^3+x-1}{h}$$

$1x^3h^0 + 3x^2h^1 + 3x^1h^2 + 1x^0h^3$

$$\frac{x^3+3x^2h+3xh^2+h^3-x-h+1-x^3+x-1}{h}$$

$$\frac{3x^2h+3xh^2+h^3-h}{h} = 3x^2+3xh+h^2-1$$

9. Find the **average rate of change function** using the difference quotient for the following function: **(Rationalize the numerator and completely simplify)**

$f(x) = 5\sqrt{x+1}$

$$\frac{5\sqrt{(x+h)+1}-5\sqrt{x+1}}{h} = \frac{5(\sqrt{x+h+1}-\sqrt{x+1})}{h}$$

$$\frac{5(\sqrt{x+h+1}-\sqrt{x+1})}{h}\times\frac{\sqrt{x+h+1}+\sqrt{x+1}}{\sqrt{x+h+1}+\sqrt{x+1}}$$

$$\frac{5(x+h+1-x-1)}{h(\sqrt{x+h+1}+\sqrt{x+1})} = \frac{5h}{h(\sqrt{x+h+1}+\sqrt{x+1})}$$

$$\frac{5}{\sqrt{x+h+1}+\sqrt{x+1}}$$

-2

Negati

10. Using the points $A(5,1), B(-1,1), C(-2,0)$,

a) Write the equation of the perpendicular bisector of $\overline{BC}$ in ***point slope*** form.

$m = \frac{1-0}{-1+2} = \frac{1}{1} = 1$

$M\left(\frac{-1-2}{2}, \frac{1+0}{2}\right) = M\left(-\frac{3}{2}, \frac{1}{2}\right)$

$y - \frac{1}{2} = (-)(x + \frac{3}{2})$

b) Find the location of the center of the circle that contains the three points.

$m = \frac{1-1}{5-(-1)} = \frac{0}{6} = 0$

$M\left(\frac{5-1}{2}, \frac{1+1}{2}\right) = (2,1)$

$x = 2$

$y - \frac{1}{2} = -x - \frac{3}{2}$

$y = -x - 1$

$y = (-2) - 1$

$y = (-3)$

$(2,-3)$

c) Find the ***exact*** area of the circle.

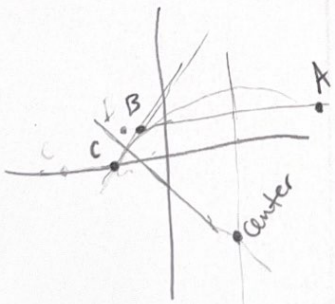
A(5,1) L(2,-3)

$r = \sqrt{(5-2)^2 + (1+3)^2}$

$r = \sqrt{3^2 + 4^2}$

$r = \sqrt{9+16} = \sqrt{25}$

$r = 5$

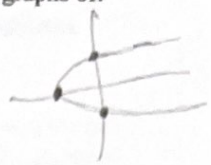


$A = \pi(5)^2$

25π

11. Find the ***x and y*** intercepts of the graphs of:

a) $y^2 = x + 1$



$0^2 = x + 1$

$0 = x + 1$

$x = (-1)$ ← x-int.

$y^2 = 1$

$y = \pm 1$

$y = 1, y = (-1)$ ← y-int.

b) $y = -|x + 10|$

$0 = -|x + 10|$

$0 = x + 10$

$x = (-10)$ ← x-int.

$y = -|10|$

$y = (-10)$ ← y-int.

12. Use algebra tests to describe the symmetry of the following:

a) $x - y^2 = 0$

× $-x - y^2 = 0$

$x - (-y)^2 = 0$

✓ $x - y^2 = 0$ → symmetry ov x-axis

$-x - (-y)^2 = 0$

× $-x - y^2 = 0$

b) $xy = 4$

× $(-x)y = 4$

$-xy = 4$

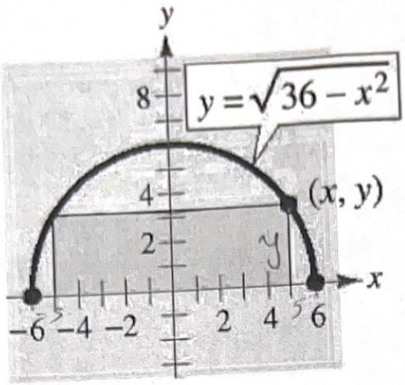
$x(-y) = 4$

× $-xy = 4$

$(-x)(-y) = 4$

✓ $xy = 4$ → symmetry ove origin

13. A rectangle is bounded by the x-axis and the semicircle $y = \sqrt{36 - x^2}$ (see figure).



a) Write the area A of the rectangle as a function of x.

$A = 10y$

$y = \sqrt{36 - x^2}$

$A = 10\sqrt{36 - x^2}$ -1

b) Determine the domain in interval notation.

$[-6, 6]$ -1

14. Considering what you know about functions:

a) Give an example of a relation that is a function but not one to one.

$y = x^2$

b) Give an example of a relation that is **not** a function.

$y^2 = x$

2