Math Test 3

Pre-Calculus 12
Enriched

Name: Key
Apr. 2019

Multiple Choice:

1.) Given $f(x) = x^2 - 3$, identify which point is on the graph of $y = \frac{1}{f(x)}$.

a.) $(0,-3)$ b.) $(2,1)$ c.) $(1,-2)$ d.) $(\sqrt{3},0)$

2.) If the graph of $y = \sqrt{x}$ is stretched horizontally by a factor of 3, identify the resulting function.

a.) $y = \frac{1}{3}\sqrt{x}$ b.) $y = 3\sqrt{x}$ c.) $y = \sqrt{\frac{1}{3}x}$ d.) $y = \sqrt{3x}$

3.) Indicate which function has a horizontal asymptote at $y = \frac{1}{2}$.

a.) $y = \frac{x-2}{x^2}$ b.) $y = \frac{x+2}{2x}$ c.) $y = \frac{x}{x+2}$ d.) $y = \frac{x^2}{x-2}$

4.) Given the graph of $f(x) = \sqrt{x}$, the function $g(x) = \sqrt{x} - 2$ can be described as:

a.) a horizontal translation of $f(x)$ right 2 units
b.) a horizontal translation of $f(x)$ left 2 units
c.) a vertical translation of $f(x)$ down 2 units
d.) a vertical translation of $f(x)$ up 2 units

5.) If (a,b) is a point on the graph of $y = f(x)$, identify which of the following points is on the graph of $y = \frac{1}{2}f(x)$.

a.) $\left(a, \frac{1}{2}b\right)$ b.) $\left(\frac{1}{2}a, b\right)$ c.) $(a,2b)$ d.) $(2a,b)$

Short Answer:

(5)

1.) If the graph of $f(x)=\frac{1}{x+3}$ is reflected in the y-axis, state equation of the new graph, $g(x)$.

$g(x) = \frac{1}{-x+3}$ or $g(x) = f(-x)$

2.) If the graph of $f(x)=\sqrt{x}$, write the equation that horizontally shifts $f(x)$ right 5 units.

$y = \sqrt{x-5}$

3.) State the non-permissible value(s) for $\frac{x-1}{x(x-3)} = 0$.

$x = 0, 3$

4.) State the roots of the equation, $(x+1)(x-2)(x-4)=0$.

$x = -1, 2, 4$

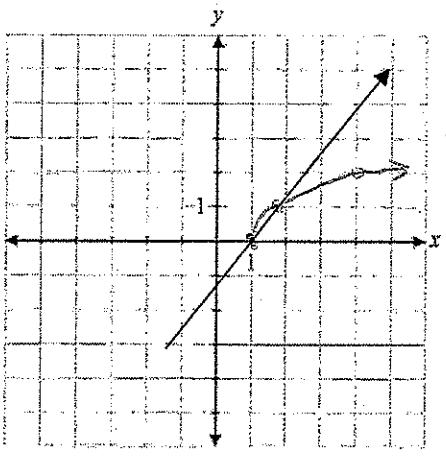
5.) If the point (-2, 4) is on the graph of $f(x)$ state the coordinates of the point it will map onto on the graph of $y=f(2(x+1))$.

$(-2, 4)$

Long Answer: Show all work for full marks

1.) Given the graph of $y=f(x)$, sketch the graph of $y=\sqrt{f(x)}$.

(2)



2.) Explain how you can use transformations to identify the domain and range of the function $y = -2\sqrt{3(x-4)} + 9$.

(2)

D: $[4, \infty)$

R: $(-\infty, 9]$

3.) Given the rational function $y = \frac{x-1}{x^2+1}$, determine:

(4)

a.) the x-intercept(s) of the graph.

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

$x = 1$

b.) the y-intercept of the graph.

$y = -1$

c.) the equations of any asymptotes.

$y = 0$

4.) Given the rational function $y = \frac{x-3}{x^2-9}$, determine the coordinates of the point of discontinuity.

(2)

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

$y = \frac{1}{x+3}$

p.d. @ $(3, \frac{1}{6})$

5.) Sketch accurately, labeled graphs for each of the following.
State the Domain, Range, and any discontinuities.

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

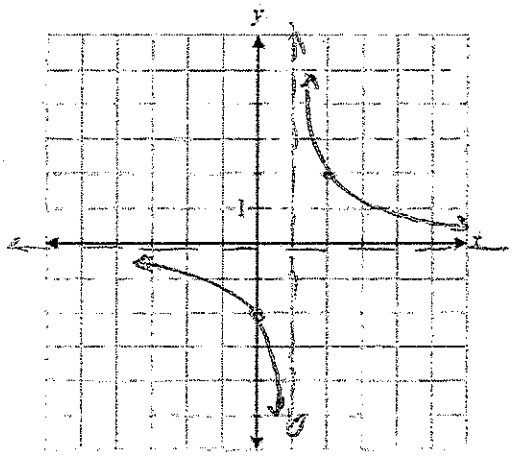
no x-int

y-int -2

V.A. $x = 1$

H.A. $y = 0$

$f(2) = \frac{2}{2-1} = 2$



Domain: $x \neq 1$

Range: $y \neq 0$

b.) $f(x) = \frac{x^2}{x^2-9}$ (4)

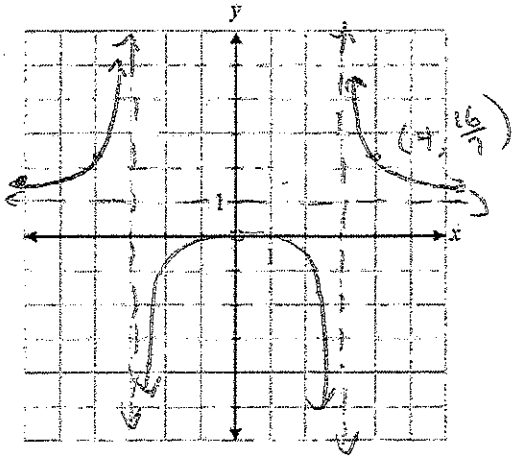
x-int 0

y-int 0

V.A. $x = \pm 3$

H.A. $y = 1$

$f(\pm 4) = \frac{16}{7}$



Domain: $x \neq \pm 3$

Range: $(-\infty, 0] \cup (1, \infty)$

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

$f(x) = \frac{x-1}{(x-1)(x+1)} = \frac{1}{x+1}$

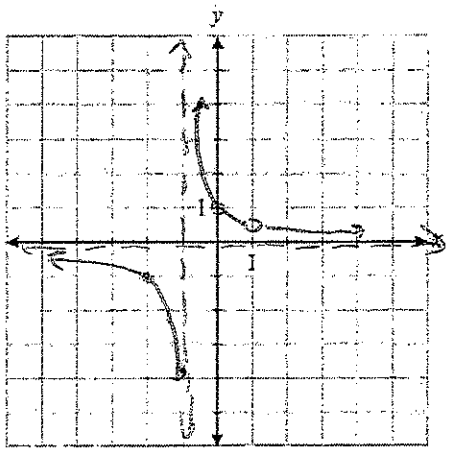
y-int 1

hole $(1, \frac{1}{2})$

no x-int

V.A. $x = -1$

H.A. $y = 0$



Domain: $x \neq \pm 1$

Range: $y \neq 0, \frac{1}{2}$

$f(-2) = \frac{1}{-2+1} = -1$