Quiz 1-1 Review Problems

Precalculus

Name: Correctly.

Block: ____ Date: ____

Find the x and y intercepts and the domain of the following functions:

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1) $f(x) = 6x^2 + 19x - 7$

x-int: $-7/2, \frac{1}{3}$

y-int: -7

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

x-int $ac = -42 \rightarrow 21, -2$

$6x^2 - 2x + 21x - 7$

$2x(3x-1) + 7(3x-1)$

$(2x+7)(3x-1)$

$x = -7/2, \frac{1}{3}$

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2) $f(x) = \frac{x+7}{x-9}$

x-int: -7

y-int: $-7/9$

D: $(-\infty, 9) \cup (9, \infty)$

x-int

$0 = \frac{x+7}{x-9}$

$x+7 = 0$

$x = -7$

Domain

$x - 9 = 0$

$x \neq 9$

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3) $f(x) = \frac{4x}{x^2-100}$

x-int: 0

y-int: 0

D: $(-\infty, -10) \cup (-10, 10) \cup (10, \infty)$

x-int

$0 = \frac{4x}{x^2-100}$

$4x = 0$

$x = 0$

domain

$x^2 - 100 = 0$

$x^2 = 100$

$x \neq \pm 10$

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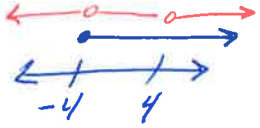
4) $f(x) = \frac{\sqrt{3x+12}}{x^2-16}$

x-int: dne

y-int: $-\frac{\sqrt{3}}{8}$



domain: $(-4, 4) \cup (4, \infty)$

x-int

$0 \stackrel{?}{=} \sqrt{3x+12}$

$0 = 3x + 12$

$-12 = 3x$

$x = -4$

but is excluded from domain

Domain

$x^2 - 16 = 0$

$x^2 = 16$

$x \neq \pm 4$

$3x + 12 \geq 0$

$3x \geq -4$

$x \geq -4$

y-int

$y = \frac{\sqrt{12}}{-16}$

$y = \frac{2\sqrt{3}}{-16}$

$y = -\frac{\sqrt{3}}{8}$

5) $f(x) = \frac{x^2+6}{x}$

x-int: dne

y-int: dne

D: $(-\infty, 0) \cup (0, \infty)$

x-int

$x^2 + 6 = 0$

$x^2 = -6$

$x = \pm\sqrt{-6}$

domain

$x \neq 0$

y-int

$y = \frac{0^2+6}{0}$

$y = \frac{6}{0}$

dne

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6) $f(x) = \frac{x-3}{\sqrt{x^2-3x-54}}$

x-int: 3

y-int: dne

D: $(-\infty, -6) \cup (9, \infty)$

x-int

$x - 3 = 0$

$x = 3$

y-int

$y = \frac{-3}{\sqrt{-54}}$

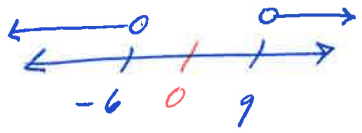
dne

domain

$x^2 - 3x - 54 = 0$

$(x+6)(x-9) = 0$

$x = -6 \quad x = 9$



test $x = 0$

$0^2 + 3(0) - 54$

-54

open dot because the radical is in the denom

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7) $f(x) = 9x^2 - 12x + 4$

x-int: $\frac{2}{3}$

y-int: 4

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

x-int

$9 \cdot C = 36 \rightarrow -6, -6$

$9x^2 - 6x - 6x + 4 = 0$

$3x(x-2) - 2(3x-2) = 0$

$(3x-2)(3x-2) = 0$

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

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8) $f(x) = \sqrt{\frac{x-4}{x+10}}$

x-int: 4

y-int: dne

D: $(-\infty, -10) \cup [4, \infty)$

x-int

$0^2 = \frac{x-4}{x+10}$

$0 = \frac{x-4}{x+0}$

$x - 4 = 0$

$x = 4$

y-int

$y = \sqrt{\frac{0-4}{0+10}}$

$y = \sqrt{\frac{-4}{10}}$

dne

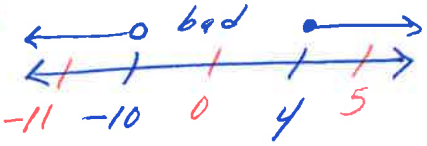
domain

$x - 4 = 0$

$x = 4$ solid

$x + 10 = 0$

$x = -10$ open



9) $f(x) = \sqrt{\frac{x^2-x-20}{x^2-100}} = \sqrt{\frac{(x-5)(x+4)}{(x+10)(x-10)}}$

x-int: $-4, 5$

y-int: $\sqrt{\frac{1}{5}}$

D: $(-\infty,-10)\cup[-4,5]\cup(10,\infty)$

x-int

$x-5=0 \quad x+4=0$

$x=5 \quad x=-4$

y-int

$y=\sqrt{\frac{-20}{-100}}$

$y=\sqrt{\frac{1}{5}}$

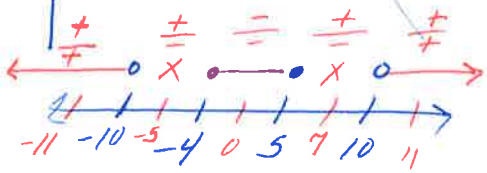
domain

$x=5$ closed

$x=-4$ closed

$x=10$ open

$x=-10$ open



10) $f(x) = \sqrt{x^3+17x^2+70x}$

x-int: $-10, -7, 0$

y-int: 0

D: $[-10,-7]\cup[0,\infty)$

x-int

$0 = x^3+17x^2+70x$

$0 = x(x^2+17x+70)$

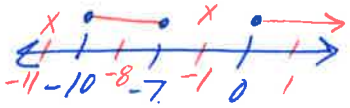
$0 = x(x+10)(x+7)$

$x = 0, -10, -7$

y-int

$y=\sqrt{0^3+17(0)^2+70(0)}$

Domain



11) $f(x) = \frac{x^2+7}{x^2+10}$

x-int: dne

y-int: $7/10$

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

$x^2+7=0$

$x^2=-7$

dne

domain

$x^2+10=0$

$x^2=-10$

$\mathbb{R}$

12) $f(x) = \sqrt{\frac{3x^2-15x}{x^3+17x^2+72x}}$

x-int: $0, 5$

y-int: dne

D: $(-9,-8)\cup[5,\infty)$

x-int

$3x^2-15x=0$

$3x(x-5)=0$

$3x=0 \quad x-5=0$

$x=0 \quad x=5$

y-int

$y=\sqrt{\frac{0}{0}}$

dne

$\sqrt{\frac{3x(x-5)}{x(x+8)(x+9)}}$

$x^3+17x^2+72x=0$

$x(x^2+17x+72)=0$

$x(x+8)(x+9)=0$