H Math 2 Name Key

Unit 6: More Graphing

Graph each function. Be sure to show all critical points and any asymptotes.

1) $y = \sqrt{x+5}$ Radical (Square Root)

Transformation(s): shift left 5

Domain: $[-5, \infty)$

Range: $[0, \infty)$

Interval of increasing: $[-5, \infty)$

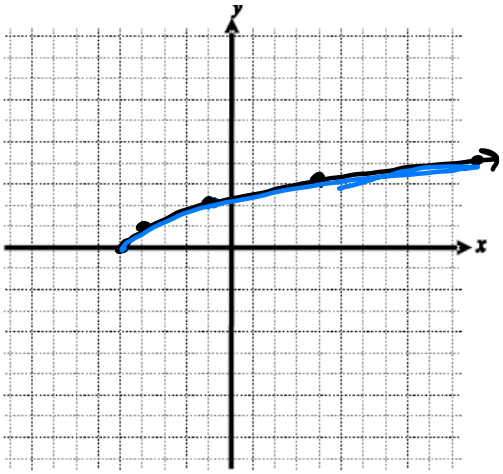
Interval of decreasing: N/A

x-intercept(s): $(-5, 0)$

y-intercept(s): $(0, \sqrt{5})$

End Behavior: L.E.B. DNE

R.E.B. $x \to \infty$, $y \to \infty$



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

Transformation(s): • Reflect over x-axis, shift right 1 & up

Domain: $[1, \infty)$

Range: $(-\infty, 4]$

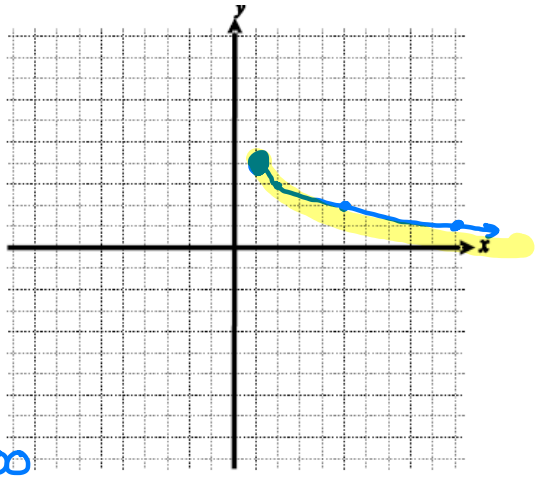
Interval of increasing: N/A

Interval of decreasing: $[1, \infty)$

x-intercept(s): $(17, 0)$

y-intercept(s): none

End Behavior: R.E.B. $x \to \infty$, $f(x) \to -\infty$



$0 = -\sqrt{x-1} + 4$

$\frac{-4}{-1} = \frac{-1\sqrt{x-1}}{-1}$

$(4)^2 = (\sqrt{x-1})^2$

$16 = x - 1$

$17 = x$

Rational Function

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

Transformation(s): shift left 3 & down 2

Domain: $(-\infty, -3) \cup (-3, \infty)$

Range: $(-\infty, -2) \cup (-2, \infty)$

Interval of increasing: N/A

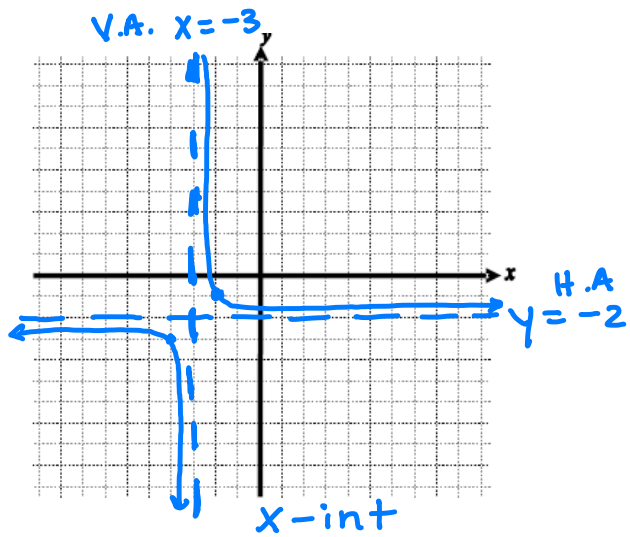
Interval of decreasing: $(-\infty, -3) \cup (-3, \infty)$

x-intercept(s): $(-2.5, 0)$

y-intercept(s): $(0, -1\frac{2}{3})$

End Behavior: L.E.B. $x \to -\infty$, $f(x) \to -2$

R.E.B. $x \to \infty$, $f(x) \to -2$



x-int

$0 = \frac{1}{x+3} - 2$

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

$2x+6 = 1$

$2x = -5$

$x = -2.5$

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

Transformation(s): • vertical stretch by 4, shift right 2 & up 3

Domain: $(-\infty, 2) \cup (2, \infty)$

Range: $(-\infty, 3) \cup (3, \infty)$

Interval of increasing: NONE

Interval of decreasing: $(-\infty, 2) \cup (2, \infty)$

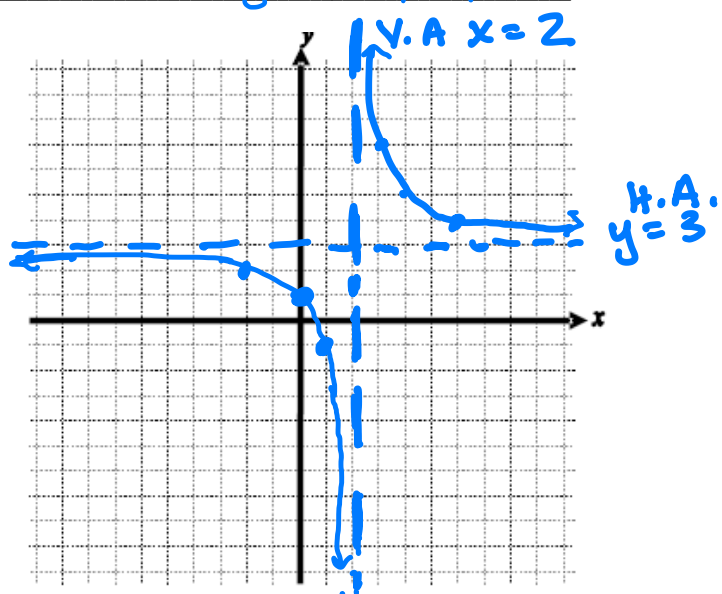
x-intercept(s): $(\frac{2}{3}, 0)$

y-intercept(s): $(0, 1)$

End Behavior:

R.E.B. $x \to \infty$, $f(x) \to 3$

L.E.B. $x \to -\infty$, $f(x) \to 3$



x-int $0 = \frac{4}{x} + 3$

$-3(x-2) = 4$

$-3x+2 = 4$

$-3x = 2$

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

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

Transformation(s): vertical stretch by 2, shift right 4 & down

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

Range: $(-\infty, -3) \cup (-3, \infty)$

Interval of increasing: N/A

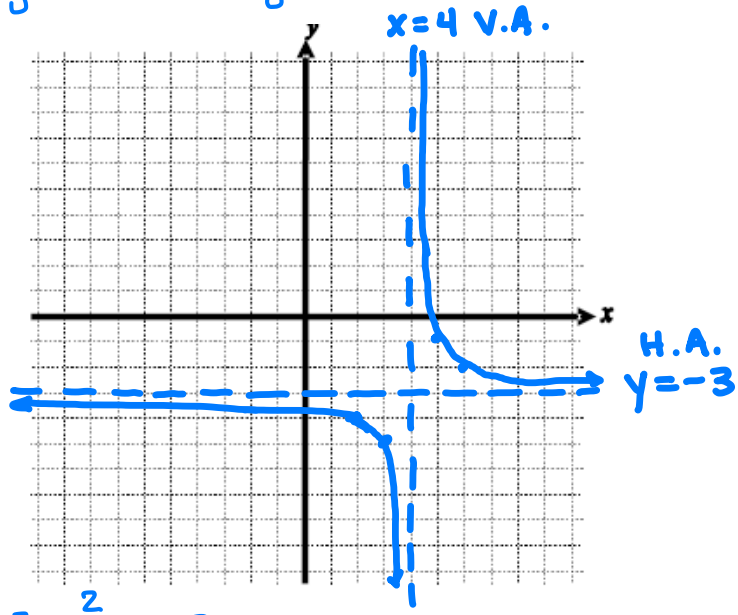
Interval of decreasing: $(-\infty, 4) \cup (4, \infty)$

x-intercept(s): $(4\frac{2}{3}, 0)$

y-intercept(s): $(0, -3\frac{1}{2})$

End Behavior: R.E.B. $x \to \infty, y \to -3$

L.E.B. $x \to -\infty, y \to -3$



$0 = \frac{2}{x-4} - 3$

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

$3(x-4) = 2$

$3x - 12 = 2$

$\frac{3x}{3} = \frac{14}{3}$

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

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

Transformation(s): • reflect over x-axis, vertical shrink by $\frac{1}{2}$

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

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

Interval of increasing: $(-\infty, 0) \cup (0, \infty)$

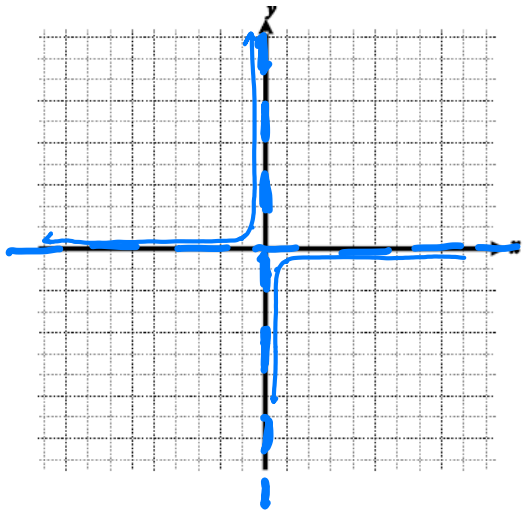
Interval of decreasing: N/A

x-intercept(s): NONE

y-intercept(s): NONE

End Behavior: L.E.B. $x \to -\infty$ $y \to 0$

R.E.B. $y \to \infty$ $y \to 0$



7) $f(x) = \frac{1}{2}\sqrt{x+3} - 1$

Transformation(s): vertical shrink by $\frac{1}{2}$, shift left 3 & down 1

Domain: $[-3, \infty)$

Range: $[-1, \infty)$

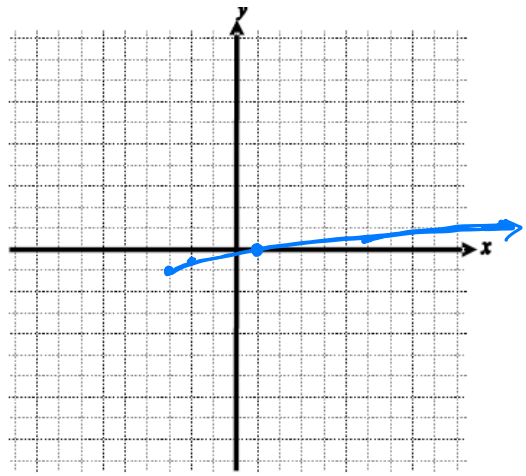
Interval of increasing: $[-3, \infty)$

Interval of decreasing: NONE

x-intercept(s): $(1, 0)$

y-intercept(s): $(0, \frac{1}{2}\sqrt{3} - 1)$

End Behavior: R.E.B. $x \to \infty, f(x) \to \infty$



8) $f(x) = -2\sqrt{x} - 5$

Transformation(s): • reflect over x-axis, vertical stretch by 2, translate down 5

Domain: $[0, \infty)$

Range: $(-\infty, -5]$

Interval of increasing: NONE

Interval of decreasing: $[0, \infty)$

x-intercept(s): NONE

y-intercept(s): $(0, -5)$

End Behavior: R.E.B. $x \to \infty, f(x) \to -\infty$