Answer:

a) $x = 7, x = -\frac{4}{3}, x = -6$

b) $\left(-6, -\frac{4}{3}\right) \cup (7, \infty)$

c) $(-\infty, 6) \cup \left(-\frac{4}{3}, 7\right)$

Station #1

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Describe how the graph of the given function can be obtained by transforming the graph of the rational function $f(x) = \frac{1}{x}$.

$$f(x) = \frac{7x - 1}{x - 5}$$

Answer:

a) $x = -\frac{1}{5}, x = 3$

b) $\left(-\infty, -\frac{1}{5}\right) \cup (3, \infty)$

c) $\left(-\frac{1}{5}, 3\right)$

Station #2

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Describe how the graph of the given function can be obtained by transforming the graph of the rational function $f(x) = \frac{1}{x}$.

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

Answer:

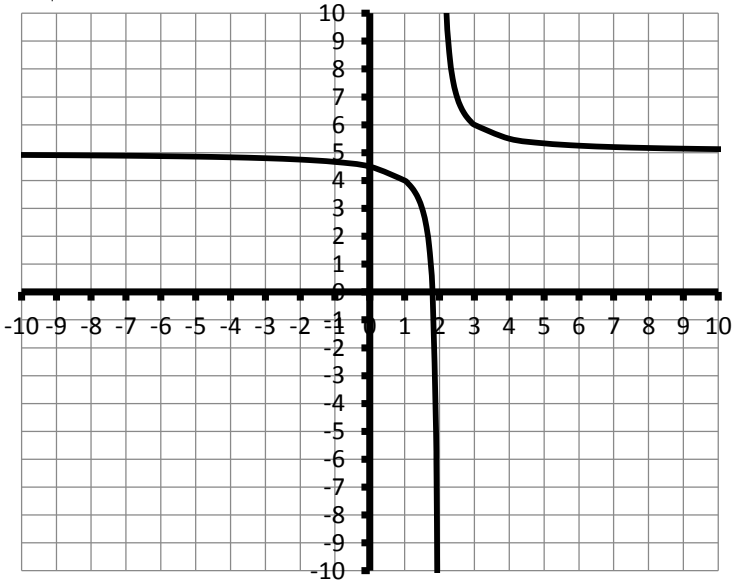
A

Station #3

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Evaluate the limit based on the graph $f(x)$ shown.

a) $\lim_{x\to 2^+} f(x)$ b) $\lim_{x\to 2^-} f(x)$ c) $\lim_{x\to\infty} f(x)$ d) $\lim_{x\to-\infty} f(x)$



Answer:

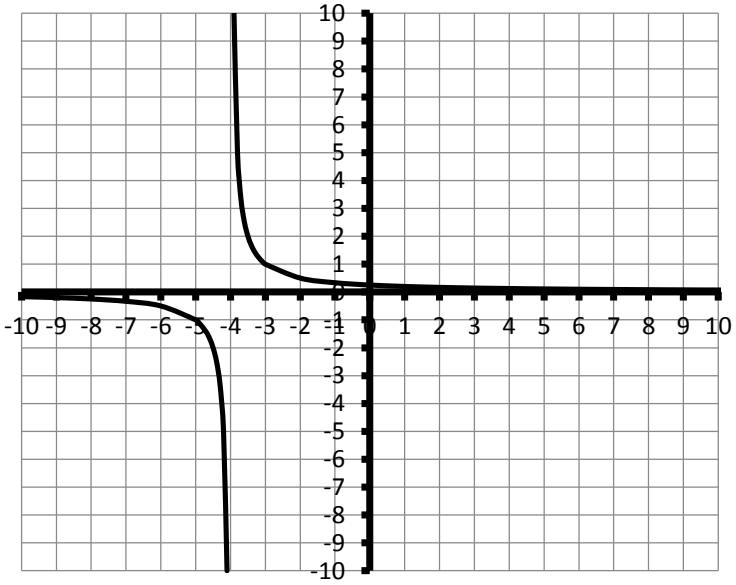
a) $x = 5$
b) $x = 8, x = -3$ and $(-\infty, -3)$
c) $(-3, 5) \cup (8, \infty)$
d) $(5, 8)$

Station #4

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Evaluate the limit based on the graph $f(x)$ shown.

a) $\lim_{x \to -4^+} f(x)$ b) $\lim_{x \to -4^-} f(x)$ c) $\lim_{x \to \infty} f(x)$ d) $\lim_{x \to -\infty} f(x)$



Answer:

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

b) $x = -8$

c) $(-8, -1) \cup \left(\frac{3}{2}, \infty\right)$

d) $(-\infty, -8) \cup \left(-1.\frac{3}{2}\right)$

Station #5

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

For the given function, find the vertical asymptote and horizontal/slant asymptotes. Also find the x-intercept and y-intercept.

$$f(x) = \frac{x^2 - 3x - 4}{x + 6}$$

Answer:

C

Station #6

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

For the given function, find the vertical asymptote and horizontal/slant asymptotes. Also find the x-intercept and y-intercept.

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

Answer:

B

Station #7

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Solve the equation algebraically:

$$\frac{1}{x+7}+\frac{2}{x+3}=\frac{-4}{x^2+10x+21}$$

A. $x=-3$

B. $x=-7$

C. $x=-3,-7$

D. No Solution

Answer:

a) $x = -6$

b) $x = -\frac{1}{2}, x = 2,$ and $(-\infty, -6)$

c) $\left(-6, -\frac{1}{2}\right) \cup (2, \infty)$

d) $\left(-\frac{1}{2}, 2\right)$

Station #8

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Solve the equation algebraically:

$$\frac{x}{2x+2} = \frac{-2x}{4x+4} + \frac{2x-3}{x+1}$$

Answer:

a) ∞ c) 5

b) $-\infty$ d) 5

Station #9

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** positive, and **(c)** negative.

$$f(x) = (x - 7)(3x + 4)(x + 6)$$

Answer:

a) ∞ c) 0

b) $-\infty$ d) 0

Station #10

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** positive, and **(c)** negative.

$$f(x) = (5x + 1)(x^2 + 2)(x - 3)$$

Answer:

- H – Right 5
- S – Vertically stretch by 34
- R – None
- V – Up 7

Station #11

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** undefined, **(c)** positive, and **(d)** negative.

$$f(x) = \frac{(2x-3)(x+1)}{x+8}$$

Answer:

- V.A.: None
- H.A.: $y = 0$
- S.A.: None
- X–Intercept: $(4,0)$
- Y–Intercept: $\left(0, -\frac{4}{9}\right)$

Station #12

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** undefined, **(c)** positive, and **(d)** negative.

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

Answer:

D

Station #13

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Determine the x values that cause the polynomial function to be **(a)** zero, **(b)** undefined, **(c)** positive, and **(d)** negative.

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

Answer:

$$x = 3$$

Station #14

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Solve the polynomial inequality.

$$(2x + 3)(x - 6)(3x - 7) \leq 0$$

A. $\left(-\infty, -\frac{3}{2}\right] \cup \left[\frac{7}{3}, 6\right]$

B. $\left(-\infty, -\frac{3}{2}\right) \cup \left(\frac{7}{3}, 6\right)$

C. $\left[-\infty, -\frac{3}{2}\right] \cup \left[\frac{7}{3}, 6\right]$

D. $\left(-\infty, \frac{7}{3}\right] \cup \left[-\frac{3}{2}, 6\right]$

Answer:

- H – Right 5
- S – Vertically stretch by 4
- R – Reflection over the x-axis.
- V – None

Station #15

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Solve the polynomial inequality.

$$2x^3 + 3x^2 - 32x - 48 > 0$$

A. $\left[-4, -\frac{3}{2}\right] \cup [4, \infty)$

B. $\left(4, -\frac{3}{2}\right) \cup (-4, \infty]$

C. $\left(-4, -\frac{3}{2}\right) \cup (4, \infty)$

D. None

Answer:

- V.A.: $x = -6$
- H.A.: None
- S.A.: $y = x - 9$
- X–Intercept: $(-1,0)$ and $(4,0)$
- Y–Intercept: $\left(0, -\frac{2}{3}\right)$

Station #16

[After you find the answer, find the next station. Remember to LOOK for the answer in the box at the top of each station!]

Solve the polynomial inequality.

$$\frac{x^2 + 2x - 35}{x^2 - 4x + 4} \geq 0$$

A. $(-\infty, -7] \cup [5, \infty)$

B. $(-\infty, -7) \cup (5, \infty)$

C. $[-7,5]$

D. $(-7,5$