## Chapter 1 Practice Test

**Directions:**

This is a 30-question practice test. It does not count toward your overall score, and you may take it as many times as you choose. Once you've completed a take, click on the Guide button in the **Results** section below for a study guide covering the questions that you missed.

1) QID: 42701

The points $A(4,-2)$, $B(-3,5)$, and $C(1,-2)$ determine a triangle. Find the distance between the midpoints of sides $AC$ and $BC$.

- $\frac{7\sqrt{2}}{2}$
- $\sqrt{2}+7$
- $\sqrt{2}-7$
- $\sqrt{2}$
- None of the above

2) QID: 43940

Given the equation.
$x^2+6\sqrt{5}x+y^2+4\sqrt{2}y=5$
complete the square for both $x$ and $y$ and find the equation of the circle.

SAMPLE

- $\left(x+3\sqrt{5}\right)^2+\left(y+2\sqrt{2}\right)^2=58$
- $\left(x+3\sqrt{5}\right)^2+\left(y+2\sqrt{2}\right)^2=24$
- $\left(x+3\sqrt{5}\right)^2+\left(y+2\sqrt{2}\right)^2=53$
- $\left(x+3\sqrt{5}\right)^2+\left(y+2\sqrt{2}\right)^2=18$
- None of the above

3) QID: 44045

What is the radius of the circle between and tangent to the circles with these equations:
$(x+6)^2+(y+8)^2=1$
$(x+5)^2+(y-8)^2=1$

- $\frac{\sqrt{257}}{2}$
- $\frac{\sqrt{257}-3}{2}$
- $\sqrt{257}+2$
- $\sqrt{257}$
- None of the above

4) QID: 26185

Over what interval is the following piecewise function increasing?

$$f(x)=\begin{cases}-1-x & \text{for } x<-2\\ 3x+7 & \text{for } -2\le x\le -1\\ 1 & \text{for } x>-1\end{cases}$$

- $(-\infty,-2)$
- $[-2,-1]$
- $(-1,\infty)$
- The function is not increasing over any range.
- None of the above

5) QID: 44738

Given the function

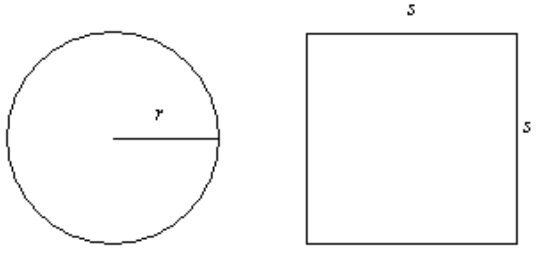
$$f(x)=\begin{cases}-3x & \text{if} \quad x<-4\\ 2x-3 & \text{if} \quad -4\le x\le 1,\\ -5x & \text{if} \quad x>1\end{cases}$$

evaluate $f(1)$.

- $-1$
- $1$
- $-3$
- $-5$
- None of the above

6) QID: 44916

A rope 18 feet long is cut into two pieces. One piece is used to form a circle and the other used to form a square. Find a function representing the area of both square and circle as a function of the length of one side of the square.

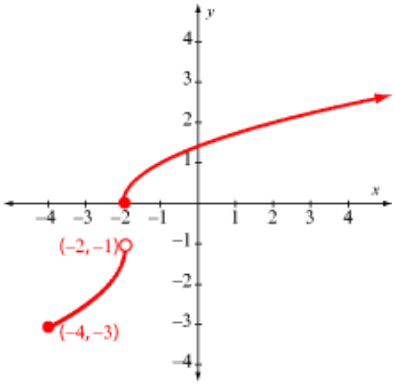



- $\dfrac{81+4s^2-36s+\pi s^2}{\pi}$
- $\dfrac{81+\pi s^2}{\pi}$
- $\dfrac{81+4s^2+\pi s^2}{\pi}$
- $\dfrac{81+4s^2+36\pi s+\pi s^2}{\pi}$
- None of the above

SAMPLE

7) QID: 54813

What is the domain of the following function?




- $(-4, \infty)$
- $[-3, -1) \cup (0, \infty)$
- $[-4, -2) \cup [-2, \infty)$
- $[-4, \infty)$
- None of the above

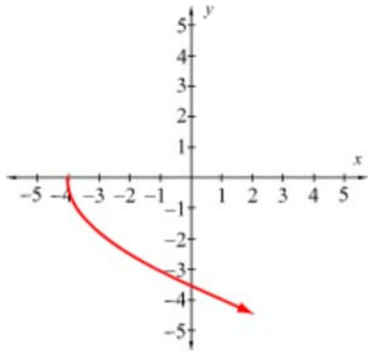
8) QID: 9419

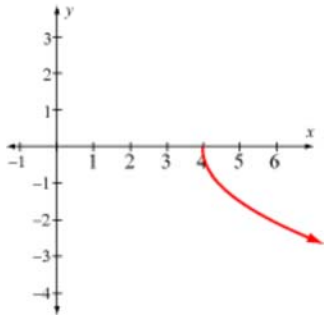
Given the function $f(x) = \sqrt{4 - x^2}$, find its domain.

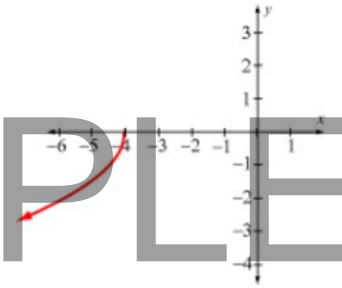
- $x \leq 2$
- $x \geq 2$
- $-2 \leq x \leq 2$
- $x \leq -2$ or $x \geq 2$
- None of the above.

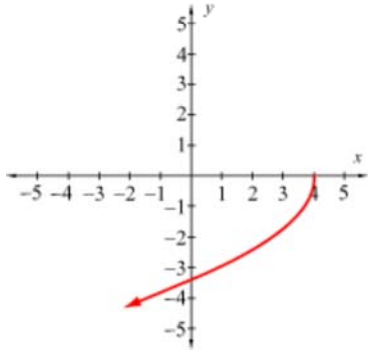
SAMPLE

Which of the following graphs most likely represents $y = -\sqrt{3x + 12}$?



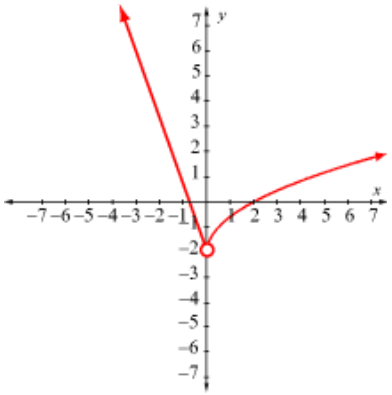



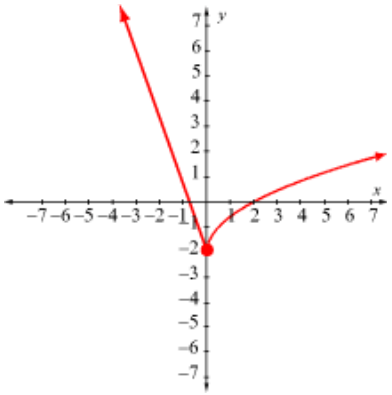

SAMPLE

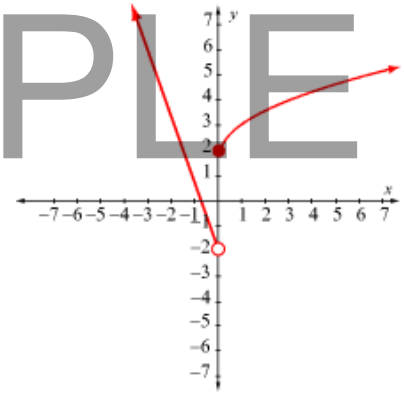
10) QID: 46255

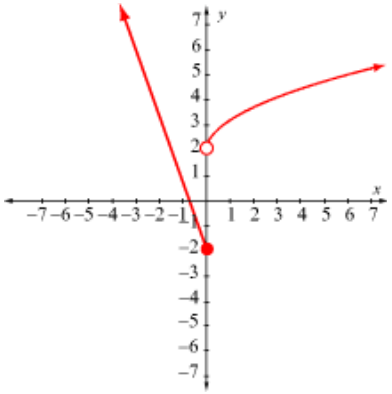
Find the graph of the function.

$$f(x)=\begin{cases}\sqrt{x}+2, & x\geq 0\\ -3x-2, & x<0\end{cases}$$







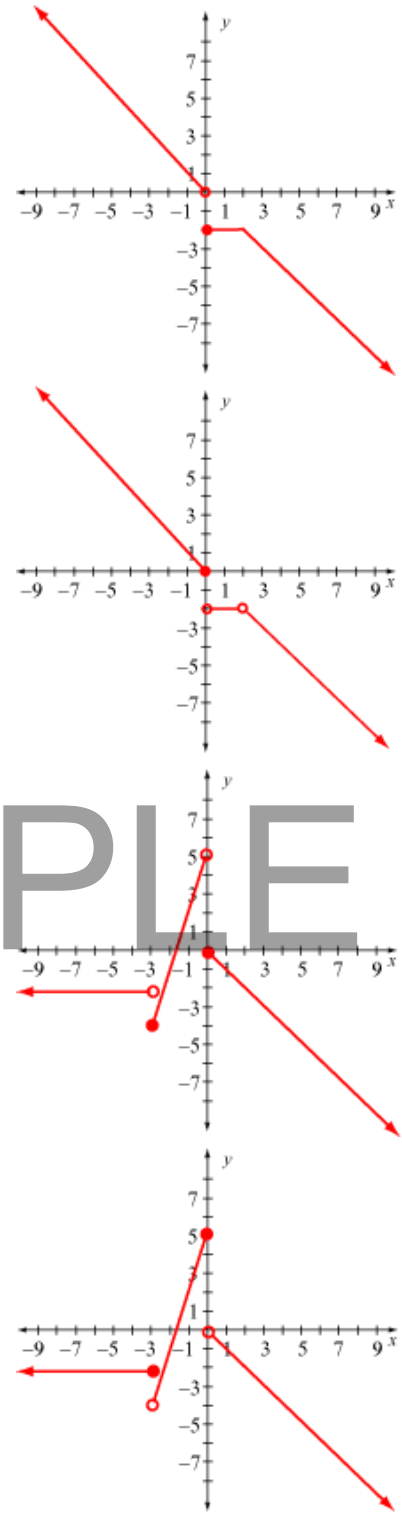


SAMPLE

11) QID: 46828

Graph:

$$y = \begin{cases} -2 & \text{if} \quad x < -3 \\ 5 + 3x & \text{if} \quad -3 \le x < 0 \\ -x & \text{if} \quad x \ge 0 \end{cases}$$



SAMPLE

12) QID: 9800

In a baseball game, a batter pops a ball straight up in the air and the height of the ball is given by the function $f(t) = -16t^2 + 128t$, where $t$ is the elapsed time in seconds. A seagull then plucks the ball out of the air and swallows it. If the ball never reached its maximum height, and the seagull had an altitude of 192 feet when it swallowed the ball, find the time when the seagull ate the ball.

- 1
- 2
- 3
- 4
- None of the above

13) QID: 48541

A fence of 300 feet is used to enclose a rectangular garden. Find the maximum area possible for the garden.

- 75 square feet
- 3000 square feet
- 5000 square feet
- 3600 square feet
- None of the above

14) QID: 47144

Beginning with the graph of the function $y = 3(x+3)^2 - 4$, which of the following shows the changes you would make to the function so that the vertex lies at $(2, 4)$ and the parabola becomes 4 times wider and it opens in a negative direction?

- $y = -\frac{3}{4}(x-2)^2 + 4$
- $y = -\frac{3}{4}(x-2)^2$
- $x = -\frac{3}{4}(y-2)^2 + 4$
- $y = \frac{1}{2}(x-2)^2 + 4$
- None of the above

SAMPLE

15) QID: 48911

If $f(x)$ is an even function and the point $(-5,-3)$ lies on the graph of $f(x)$, identify an additional point on the graph.

- $(5,3)$
- $(-5,-3)$
- $(-5,3)$
- $(-5,0)$
- None of the above

16) QID: 53934

Determine if the function is even, odd, or neither:
$f(x) = 2x^5 - x^3$

- Even
- Odd
- Neither

17) QID: 46546

If $f(x) = 3 + 2x$ and $g(x) = x^2 + 2$,
find (a) $(f \circ g)(x)$ and (b) $(g \circ f)(x)$.

- (a) $x^2 + 2x + 5$
  (b) $2x^2 + 7$
- (a) $4x^2 + 12x + 11$
  (b) $x^2 + 2x - 5$
- (a) $x^2 + 2x - 5$
  (b) $2x^2 + 11x$
- (a) $2x^2 + 7$
  (b) $4x^2 + 12x + 11$
- None of the above

SAMPLE

18) QID: 24978

Find the difference quotient
$D(x) = \dfrac{f(x+h) - f(x)}{h}$
for $f(x) = \sqrt{x}$.

- $D(x) = \dfrac{\sqrt{h}}{h}$
- $D(x) = \dfrac{\sqrt{x} + h - \sqrt{x}}{h}$
- $D(x) = \dfrac{\sqrt{x+h} - \sqrt{x}}{h}$
- $D(x) = \dfrac{\sqrt{x-h} - \sqrt{x}}{h}$
- None of the above

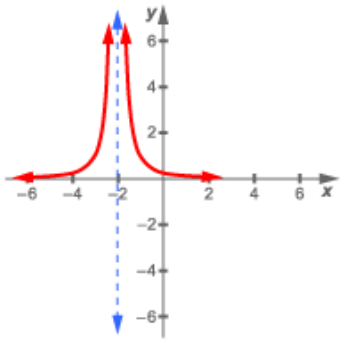
19) QID: 47332

Find the difference quotient $\dfrac{f(x+h) - f(x)}{h}$ for the function $f(x) = -2x^2 + x + 6$.

- $-4x - 2h + 1 - \dfrac{4x^2 + 2x + 12}{hx}$
- $-4x - 4h + 1$
- $-4x - 4h + 7$
- $-4x - 2h + 1$
- None of the above

20) QID: 9994

What is the range of this graph?




- $(0,\infty)$
- $(-\infty,-2)\cup(-2,\infty)$
- $(-\infty,0)\cup(0,\infty)$
- $(0,5)$

21) QID: 51365

Find the vertical asymptote(s), if any, of $f(x)=\dfrac{x-1}{x^2+6x-7}$

.

- $x=1,\ x=-7$
- $x=-1$
- $x=7,\ x=-1$
- $x=-7$
- None of the above

SAMPLE

22) QID: 50056

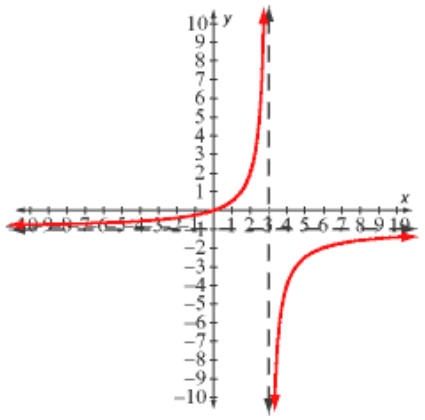
Find the horizontal asymptotes, if any, of the graph of $f(x)=\dfrac{4x^5+2}{3x^5+3x+8}$.

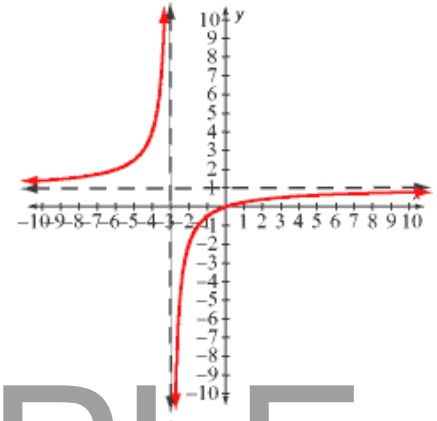
- $y=0$
- $y=\dfrac{1}{4}$
- $y=\dfrac{4}{3}$
- No horizontal asymptotes
- None of the above

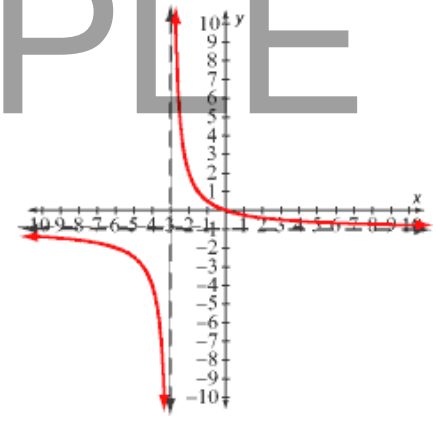
23) QID: 50143

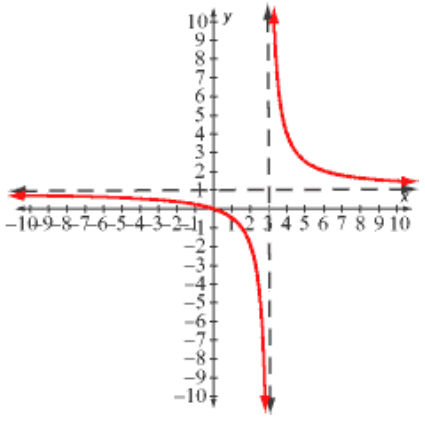
Graph the following rational function:

$f(x) = \dfrac{x}{x-3}$.





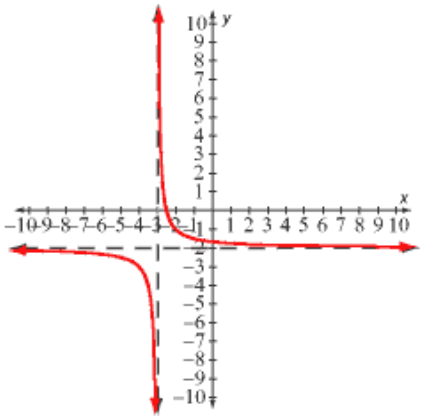


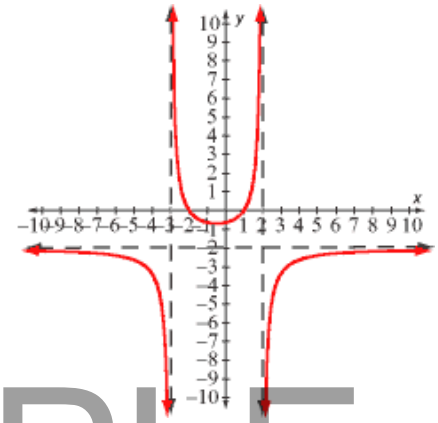


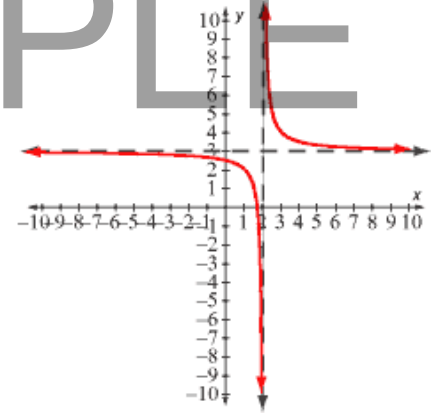
SAMPLE

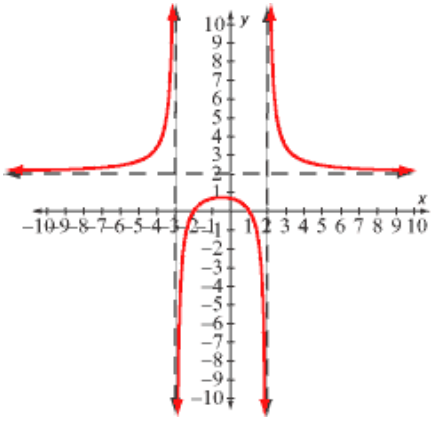
Graph the following function:

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







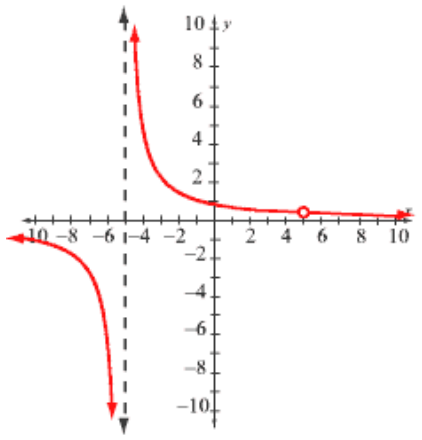


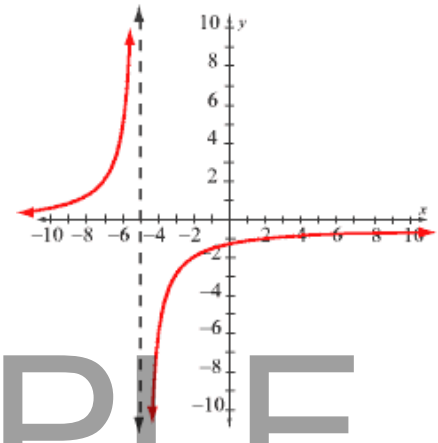
SAMPLE

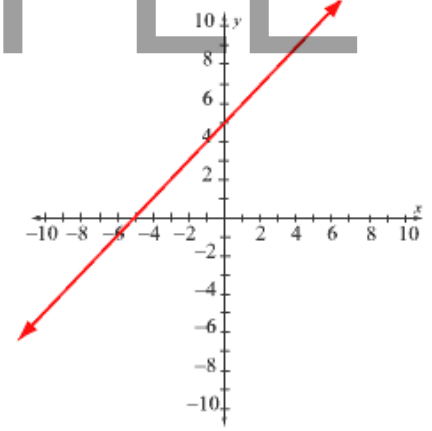
25) QID: 51400

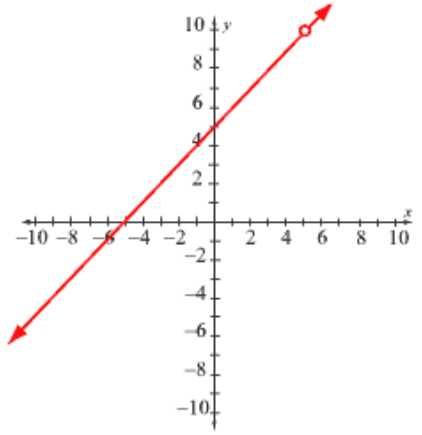
Graph:

$$f(x) = \frac{x^2 - 25}{x - 5}$$



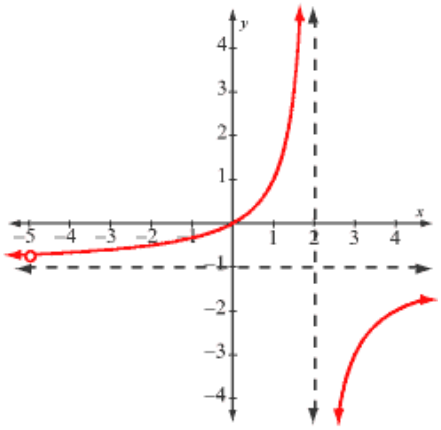



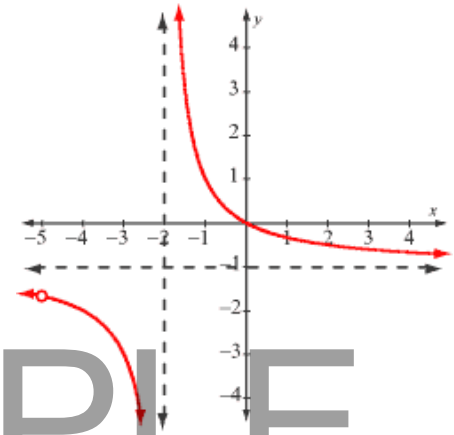

SAMPLE

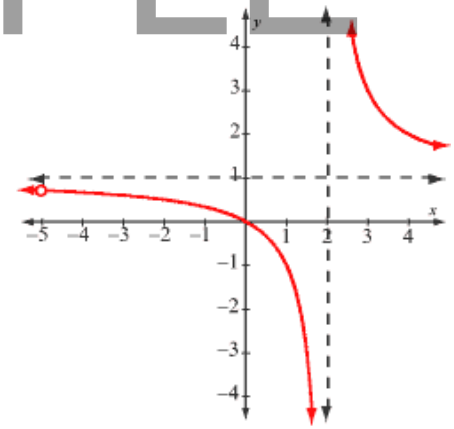
SAMPLE

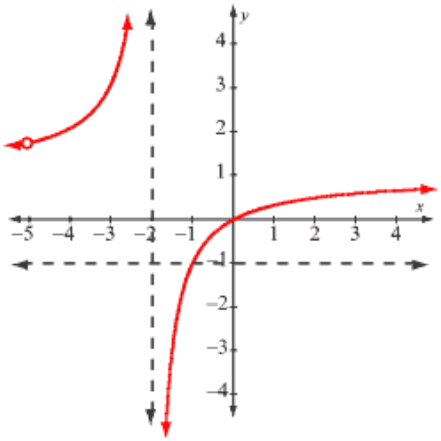
Graph:

$$f(x) = \frac{x^2 + 5x}{x^2 + 3x - 10}$$




SAMPLE

27) QID: 10060

True or false?

$f(x) = \frac{6}{x}$ is a one-to-one function.

- true
- false

28) QID: 50761

Algebraically verify whether *f* and *g* are inverses of each other or not:

$f(x) = \sqrt{8+x}$, domain $[-8,\infty)$

$g(x) = 8 + x^2$, domain $[0,\infty)$

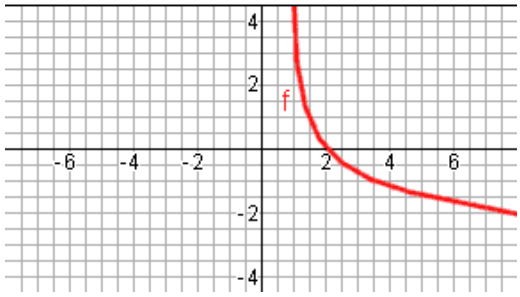
- no
- yes

SAMPLE

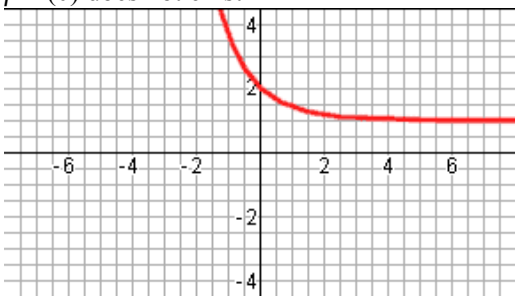
29) QID: 3711

Graph the inverse $f^{-1}$ of the function $f$, and find each value (if it exists).

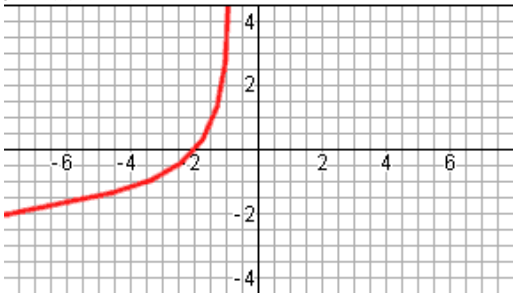
Find $f^{-1}(0)$



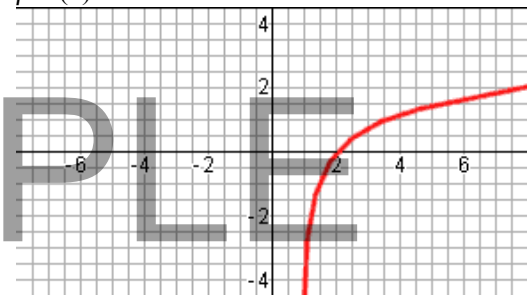

- $f^{-1}(0)$ does not exist



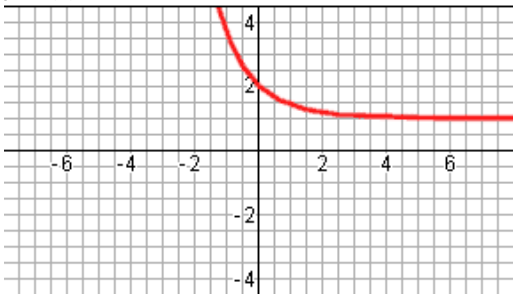
- $f^{-1}(0) = -2$



- $f^{-1}(0) = 2$



- $f^{-1}(0) = 2$



SAMPLE

Write the equation of the inverse of the given function. Then find the listed value.

$h(x) = \sqrt[4]{-6-3x},\ x \le -2$

Find $h^{-1}(2)$.

- $h^{-1}(x) = -\frac{x^4}{3} - 2,\ x \ge 0\ ;\ h^{-1}(2) = \frac{22}{3}$
- $h^{-1}(x) = -\frac{x^4}{3} - 2,\ x \ge 0\ ;\ h^{-1}(2) = -\frac{22}{3}$
- $h^{-1}(x) = \sqrt[4]{6-3x},\ x \le 2\ ;\ h^{-1}(2) = 0$
- $h^{-1}(x) = 6x^4 + 3,\ x \ge 0\ ;\ h^{-1}(2) = 99$
- None of the above

SAMPLE