

5.2: Graded Homework

Nicole Cook

✓ Question 1

✓ 1/1 pt ↺ 99

What is the end behavior of the polynomial?

$$f(x) = 5x^5 - 5x^4 + 2x^3 - 4x^2 - x + 5$$

- left -negative, right -positive
- left -positive, right -negative
- left -negative, right -negative
- left -positive, right -positive



Question Help: Message instructor

● Question 2

✓ 0/1 pt ↺ 3 ↻ 99

Describe the end behavior (long run behavior) of $f(x) = -x^8$

As $x \rightarrow -\infty$, $f(x) \rightarrow ?$ ▼

As $x \rightarrow \infty$, $f(x) \rightarrow ?$ ▼

Question Help: Video Message instructor

● Question 3

✓ 0/1 pt ↺ 3 ↻ 99

Describe the long run behavior of $f(p) = -3p^8 - p^6 - 4p^5 - 2$

As $p \rightarrow -\infty$, $f(p) \rightarrow ?$ ▼

As $p \rightarrow \infty$, $f(p) \rightarrow ?$ ▼

Question Help: Video Message instructor

● Question 4

✓ 0/1 pt ↺ 3 ↻ 99

Find the degree and leading coefficients of the polynomial.

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

Degree =

Leading Coefficient =

Question Help: Video Message instructor

● Question 5

0/1 pt 3 99

Find the degree, leading coefficients, and the maximum number of real zeros of the polynomial.

$$f(x) = -3x^2$$

Degree =

Leading Coefficient =

Maximum number of real zeros =

Question Help: Message instructor

● Question 6

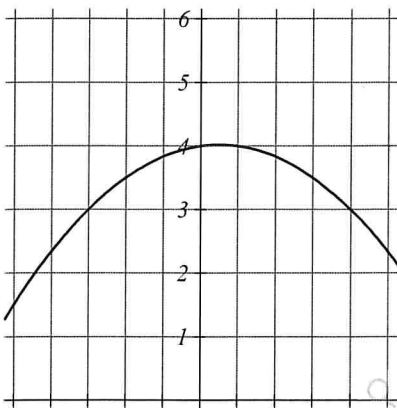
0/1 pt 3 99

Find the degree of the polynomial $y = 1 - x^6 - 3x^4 - 6x^7$

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● Question 7

0/1 pt 3 99

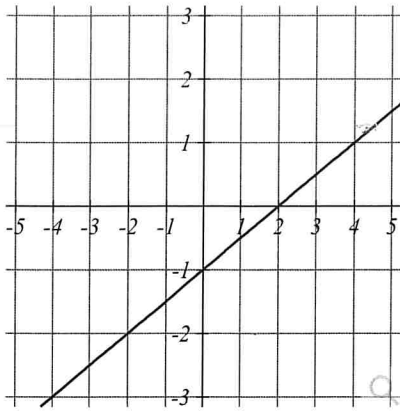


What is the least possible degree of the polynomial graphed above?

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● Question 8

0/1 pt 3 99



What is the least possible degree of the polynomial graphed above?

Question Help: [▶ Video](#) [✉ Message instructor](#)

● Question 9

0/1 pt [↶ 3](#) [↷ 99](#)

Find the zeroes and end behavior for the following function: $y = (x - 2)(x + 3)^2(x + 1)^3$

The zeros are $x =$ Select an answer

The end behavior is: ?

Question Help: [✉ Message instructor](#)

● Question 10

0/1 pt [↶ 3](#) [↷ 99](#)

Given the function $P(n) = (n - 1)(n + 5)(n - 2)$

its P -intercept is _____

its n -intercepts are _____

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● Question 11

0/1 pt [↶ 3](#) [↷ 99](#)

The polynomial of degree 5, $P(x)$ has leading coefficient 1, has roots of multiplicity 2 at $x = 2$ and $x = 0$, and a root of multiplicity 1 at $x = -3$

Find a possible formula for $P(x)$.

$P(x) =$,

Question Help: [✉ Message instructor](#)

● Question 12

0/1 pt [↶ 3](#) [↷ 99](#)

The polynomial of degree 3, $P(x)$, has a root of multiplicity 2 at $x = 4$ and a root of multiplicity 1 at $x = -4$. The y -intercept is $y = -38.4$.

Find a formula for $P(x)$.

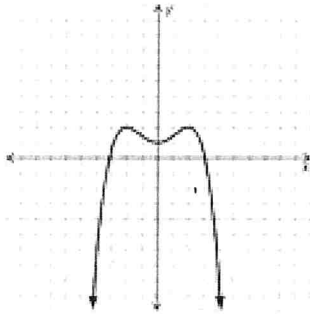
$P(x) =$

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● Question 13

0/1 pt 3 99

Determine whether the graph represents a polynomial function. Explain your reasoning.



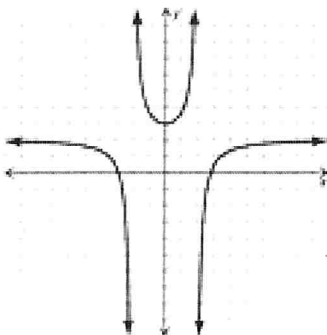
- Graph is not a polynomial because it has a sharp turn.
- Graph is not a Polynomial because the domain is not all reals.
- Graph is not a polynomial because it has a jump.
- Graph is a polynomial because it is continuous, domain is all reals, and it does not have any sharp turns.

Question Help: [✉ Message instructor](#)

● Question 14

0/1 pt 3 99

Determine whether the graph represents a polynomial function. Explain your answer.



- Graph is not a polynomial because it has a sharp turn.
- Graph is a polynomial because it is continuous, domain is all reals, and it does not have any sharp turns.
- Graph is not a polynomial because the it is not continuous.

Question Help: Message instructor

5.3: Graded Homework

Nicole Cook

● Question 1

0/1 pt 3

Given the function $g(r) = (r - 6)(r + 3)(r - 2)$:

the coordinates of its g -intercept are _____

the coordinates of its r -intercepts are _____

Question Help: Video Message instructor

● Question 2

0/1 pt 3

Given $f(x) = 6(x - 2)^4(x - 4)^5(2x - 3)^2(x + 5)^3$

List the zeroes (ex. 4, 6, -2):

Degree: _____

End behavior:

As $x \rightarrow -\infty$, $f(x) \rightarrow$ Select an answer

As $x \rightarrow +\infty$, $f(x) \rightarrow$ Select an answer

Question Help: Video 1 Video 2 Message instructor

● Question 3

0/1 pt 3

Given the function $f(x) = 3x^4 - 21x^3 + 18x^2$:

its f -intercept is _____

its x -intercepts are _____

Question Help: Video Message instructor

● Question 4

0/1 pt 3

Given the function $P(x) = (x - 2)^2(x - 5)$

Its y -intercept is _____

Its x -intercept(s) is/are _____

As $x \rightarrow \infty$, $y \rightarrow ?$ ▾

As $x \rightarrow -\infty$, $y \rightarrow ?$ ▾

Question Help: Message instructor

● Question 5

0/1 pt 3 99

Determine the zeros and the vertical intercept of the polynomial function:

$$f(x) = 4(x - 11)^2(x + 9)(x - 5)$$

The zero(s) of the is/are _____

The horizontal intercept(s) is/are _____

The vertical intercept is _____

Question Help: Message instructor

● Question 6

0/1 pt 3 99

Determine the zero(s) of the function $g(n) = 4n^4 - 44n^3 + 112n^2$

The zeros are $n =$ _____

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● Question 7

0/1 pt 3 99

Given the function $g(t) = 3t^4 + 9t^3 - 54t^2$

its g -intercept is _____

its t -intercepts are _____

Question Help: Video Message instructor

● Question 8

0/1 pt 3 99

Describe the long run behavior of $f(x) = 3(x + 5)^3(x + 2)(x + 4)^2$:

As $x \rightarrow -\infty$, $f(x) \rightarrow ?$

As $x \rightarrow \infty$, $f(x) \rightarrow ?$

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● Question 9

0/1 pt 3 99

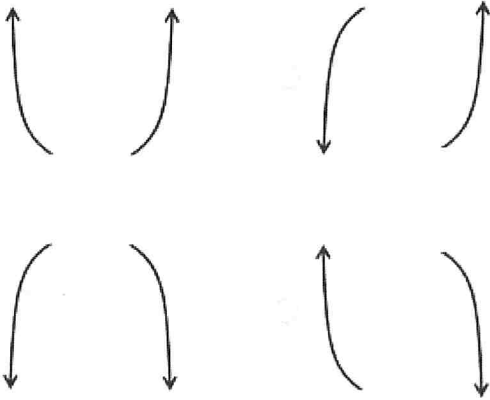
Use the polynomial function below to answer the following questions.

$$y = 12x^2 - 12x - 2$$

a) Determine the leading term of polynomial function shown above.

L.T. =

b) Use the leading term to identify the end behavior for the graph of the polynomial function. Select the correct choice below.

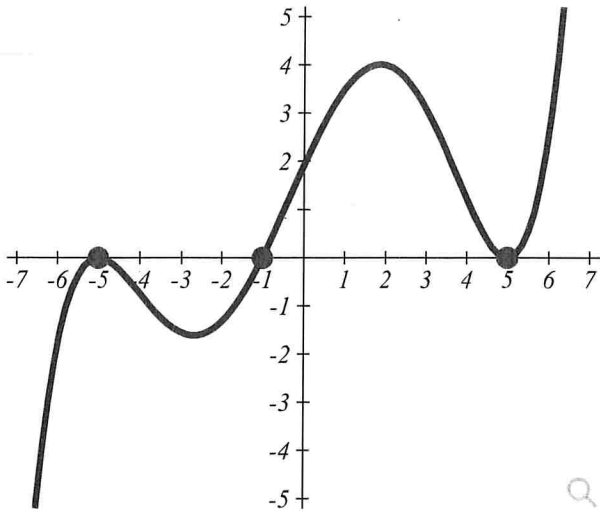


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● Question 10

0/1 pt 3 99

The graph of a 5th degree polynomial is shown below.



Use the graph to complete the table listing the x-values and multiplicities of the zeros, working from left to right.

| Zero | Multiplicity |
|-------|--------------|
| -5 | _____ |
| _____ | 1 |
| _____ | _____ |

Question Help: [Video](#) [Message instructor](#)

● Question 11

0/1 pt [↶](#) 3 [↷](#) 99

Use the given polynomial function to identify the zeros of the function and the multiplicity of each zero. Leave any remaining answer boxes empty. If one of the zeros is a decimal, be sure to record it as a fraction in lowest terms; otherwise, it will mark your answer incorrect.

$$f(x) = 4x^2(5x - 4)^3(x - 3)^3$$

| Zeros | Mult. |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Note: It is possible that some of the answer boxes will be empty!

Question Help: [Message instructor](#)

● Question 12

0/1 pt [↶](#) 3 [↷](#) 99

Given the function $f(x) = -8(x - 1)^4(x + 6)^9(x - 4)$,

its roots are _____

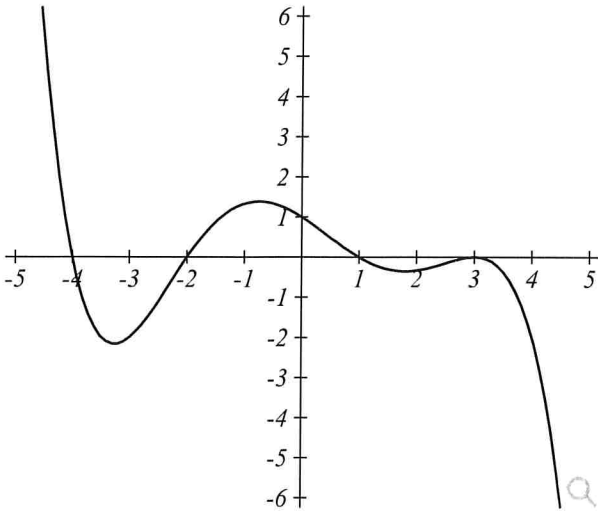
and their multiplicities are _____.

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● Question 13

0/1 pt 3 99

Write an equation for the polynomial graphed below



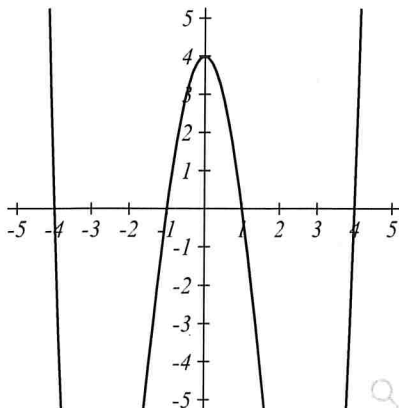
$y(x) =$

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● Question 14

0/1 pt 3 99

Write an equation for the polynomial graphed below



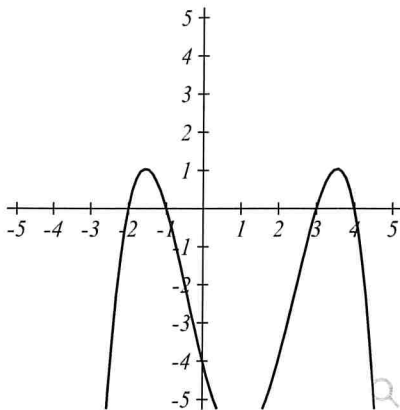
$y(x) =$

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● Question 15

0/1 pt 3 99

Write an expression in factored form for the polynomial of least possible degree graphed below.



$y(x) =$

Question Help: [Video](#) [Message instructor](#)

● Question 16

0/1 pt 3 99

Find a formula for the polynomial $P(x)$ with

- degree 3
- a root of multiplicity 2 at $x = 3$
- a root of multiplicity 1 at $x = -3$
- y -intercept $(0, -2.7)$

$P(x) =$

Question Help: [Message instructor](#)

● Question 17

0/1 pt 3 99

Find a formula for the polynomial $P(x)$ with

- degree 7
- leading coefficient 1
- root of multiplicity 3 at $x = 0$
- root of multiplicity 3 at $x = -5$
- root of multiplicity 1 at $x = 10$

$P(x) =$

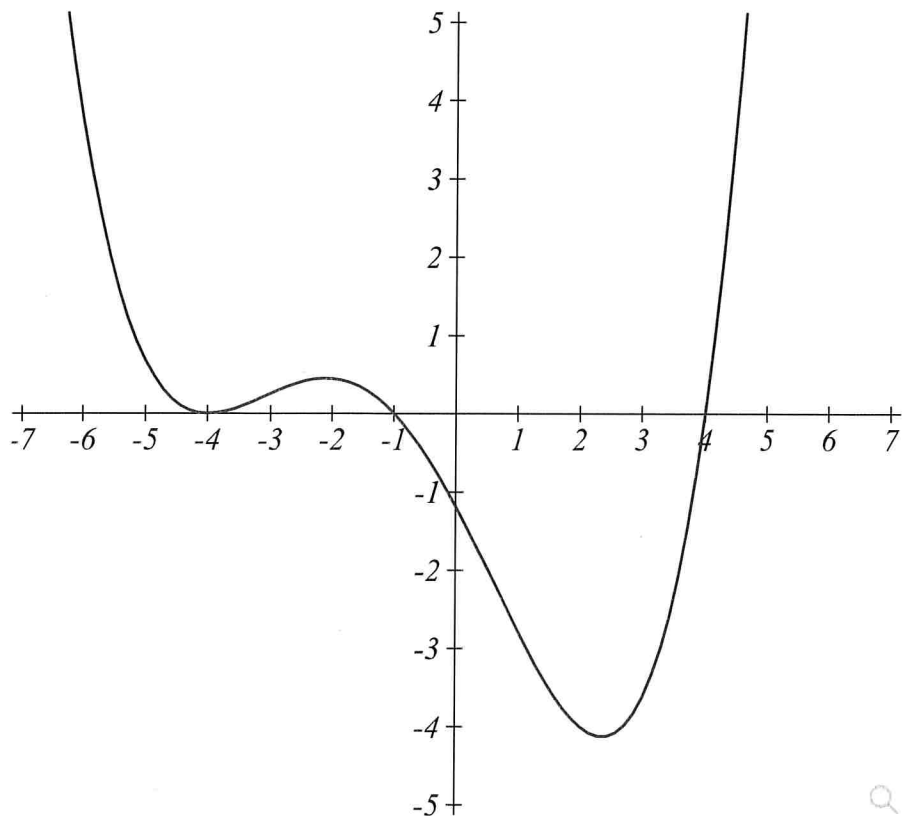
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● Question 18

0/1 pt 3 99

Given the graph of a degree 4 polynomial below, complete the table of values for either the x-value of a zero, or the multiplicity of the zero.

| Root with $x =$ | Multiplicity |
|-----------------|--------------|
| 4 | _____ |
| _____ | 2 |
| _____ | _____ |



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5.4: Graded Homework

Nicole Cook

● Question 1

0/1 pt 3 99

Find the quotient and remainder using synthetic division for: $\frac{x^3 + 4x^2 + 6x + 8}{x + 2}$

The quotient is

The remainder is

Question Help: Video 1 Video 2 Message instructor

● Question 2

0/1 pt 3 99

Find the quotient and remainder using synthetic division for
 $\frac{x^5 - x^4 + 3x^3 - 3x^2 + 5x - 6}{x - 1}$

The quotient is

The remainder is

Question Help: Message instructor

● Question 3

0/1 pt 3 99

Find the quotient and remainder using synthetic division.

$$\frac{x^4 - 3x^3 - 21x + 22}{x - 4}$$

The quotient is

The remainder is

Question Help: Video Message instructor

● Question 4

0/1 pt 3 99

Find the quotient and remainder using synthetic division for
 $\frac{x^3 + 8x^2 + 19x + 17}{x + 2}$

The quotient is

The remainder is

Question Help: Message instructor

● Question 5

0/1 pt 3 99

Use synthetic division to divide $x^5 - x^4 + 5x^3 - 5x^2 + 7x - 10$ by $x - 1$

The quotient is

The remainder is

Question Help: Message instructor

● Question 6

0/1 pt 3 99

Use synthetic division to divide $x^3 + 7x^2 + 18x + 22$ by $x + 2$

| | | | | |
|--|---|---|----|----|
| | 1 | 7 | 18 | 22 |
| | | | | |
| | | | | |
| | | | | |

The quotient is:

The remainder is:

Question Help: Video Message instructor

● Question 7

0/1 pt 3 99

Use synthetic division to divide $x^3 - x^2 - x - 7$ by $x - 3$ Give your answer in the form quotient + $\frac{\text{remainder}}{\text{divisor}}$ if necessary.

| | | | | |
|--|---|----|----|----|
| | 1 | -1 | -1 | -7 |
| | | | | |
| | | | | |
| | | | | |

answer =

Question Help: Video Message instructor

5.5: Graded Homework

Nicole Cook

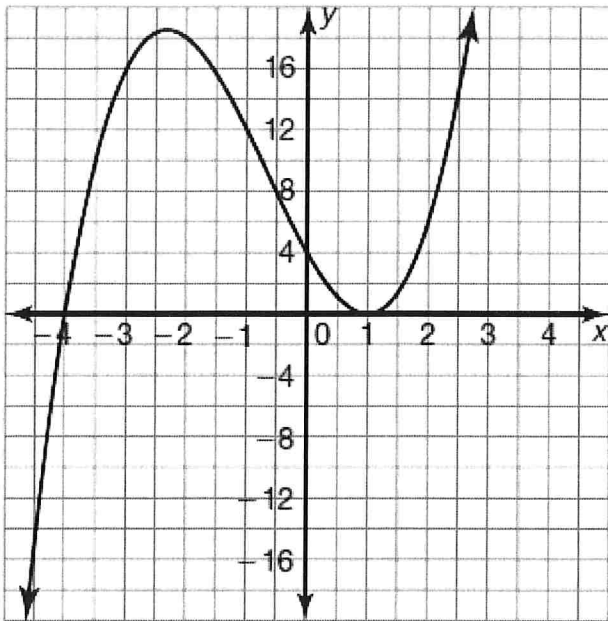
● Question 1

☑ 0/1 pt ↻ 3 ↺ 99

Describe the error in graphing $f(x)$ for the function, then graph it correctly.

(rough graph only)!

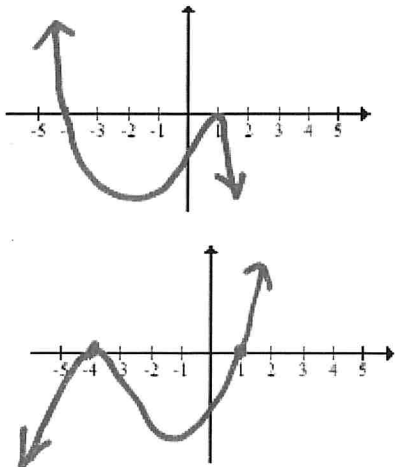
$$f(x) = (x - 4)(x + 1)^2$$

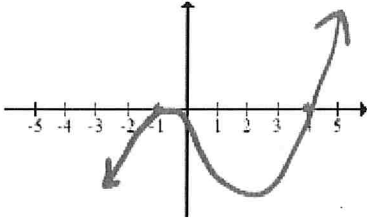
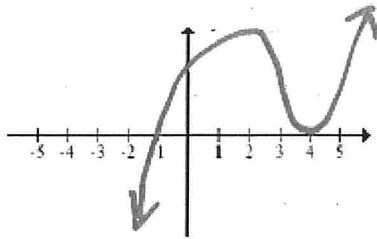


The error in this graph is: (choose all that apply)

- The x-intercepts are wrong. They should be at (0,0) and (4,0) and (-1,0).
- The end behavior is wrong it should be $\uparrow\uparrow$.
- The end behavior is wrong it should be $\downarrow\downarrow$.
- The end behavior is wrong it should be $\uparrow\downarrow$.
- The x-intercepts are wrong. They should be at (4,0) and (-1,0).

The graph should look like this:





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● Question 2

0/1 pt 3 99

The polynomial of degree 5, $P(x)$ has leading coefficient 1, has roots of multiplicity 2 at $x = 4$ and $x = 0$, and a root of multiplicity 1 at $x = -2$. Find a possible formula for $P(x)$.

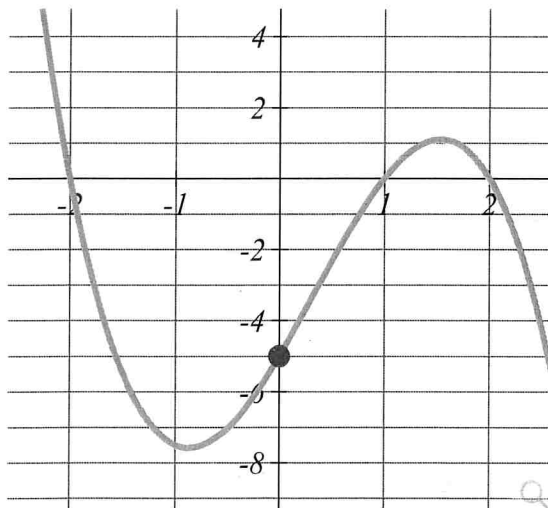
$P(x) =$,

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● Question 3

0/1 pt 3 99

Determine the equation of the 3rd degree polynomial graphed below. Write your answer in factored form. Make sure your equation passes through the indicated point.



$p(x) =$

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● Question 4

✔ 0/1 pt ↻ 3 🔁 99

Use the rational zeros theorem to list all possible zeros of the function $f(x) = 3x^3 + 3x^2 - 3x + 7$. Enter the possible zeros separated by commas. You do not need to factor the polynomial.

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● Question 5

✔ 0/1 pt ↻ 3 🔁 99

Use the rational zeros theorem to list all possible zeros of the function $f(x) = x^3 + x^2 - x + 10$. Enter the possible zeros separated by commas. You do not need to factor the polynomial.

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● Question 6

✔ 0/1 pt ↻ 3 🔁 99

Is $x + 5$ a factor of $x^5 - 6x^4 + 6x^3 - 8x^2 - 7x + 7790$?

Select an answer The remainder when you divide is _____

Is $2x - 3$ a factor of $8x^3 - 40x^2 + 16x + 39$?

Select an answer The remainder when you divide is _____

Is $x - 3$ a factor of $x^3 + 4x^2 - 7x - 30$?

Select an answer The remainder when you divide is _____

Question Help: [✉ Message instructor](#)

● Question 7

✔ 0/1 pt ↻ 3 🔁 99

Let $f(x) = 8x^2 - 4x + 7$.

When $f(x)$ is divided by $x + 2$ the remainder is:

When $f(x)$ is divided by $x + 1$ the remainder is:

When $f(x)$ is divided by x the remainder is:

When $f(x)$ is divided by $x - 1$ the remainder is:

When $f(x)$ is divided by $x - 2$ the remainder is:

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● Question 8

0/1 pt 3 99

Find all zeros of $f(x) = x^3 + 2x^2 + x + 2$. Enter the zeros separated by commas.

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● Question 9

0/1 pt 3 99

Find all zeros of the function.

$$f(x) = 25x^3 - 95x^2 + 119x - 49$$

Entry tip: Enter the zeros (exact values, not decimal approximations) separated by commas.

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● Question 10

0/1 pt 3 99

Find all zeros of the function $f(x) = 16x^3 - 48x^2 + 35x - 6$. Enter the zeros separated by commas.

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● Question 11

0/1 pt 3 99

Given $P(x) = x^3 + 2x^2 + 4x + 8$. Write P in factored form (as a product of linear factors). Be sure to write the full equation, including $P(x) =$.

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● Question 12

0/1 pt 3 99

Let $f(x) = 9x^4 + 7x^3 - 25x^2 - 17$. Use Descartes' Rule of Signs to answer the following questions.

(a) List the possible number of positive real zeros (counting multiplicities) of $f(x)$: _____

(b) List the possible number of negative real zeros (counting multiplicities) of $f(x)$: _____

(c) May anything definitive be said about the **exact** number of positive real zeros?


Select an answer

(d) May anything definitive be said about the **exact** number of negative real zeros?

Select an answer

Question Help:  Message instructor

● Question 13

 0/1 pt  3  99

Which of the following describes the number of negative roots possible of the function

$h(x) = -2x^4 - 3x^3 + 2x^2 - 2x - 3$ according to Descartes' Rule of Signs?

- Only 1
- 4, 2, or 0
- Only 2
- 3 or 1
- 2 or 0

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● Question 14

 0/1 pt  3  99

Find all zeros of the function $f(x) = 12x^3 - 53x^2 - 45x + 50$. Enter the zeros separated by commas.

Question Help:  Video  Message instructor

5.6: Graded Homework

Nicole Cook

● Question 1

0/1 pt 3 99

If $f(x) = \frac{x}{13x + 12}$, then the domain of f includes all real numbers except .

Enter answer as a reduced fraction, or DNE for Does Not Exist, or oo for Infinity

Question Help: Message instructor

● Question 2

0/1 pt 3 99

For each function, determine the long run behavior.

$\frac{x^3 + 1}{x^2 + 2}$ has Select an answer

$\frac{x^2 + 1}{x^3 + 2}$ has Select an answer

$\frac{x^2 + 1}{x^2 + 2}$ has Select an answer

Question Help: Video Message instructor

● Question 3

0/1 pt 3 99

Find the horizontal asymptote of $f(x) = \frac{3x - 2x^3 + 1}{-3x^3 - x^2 + 5}$.

$y =$

Question Help: Video Message instructor

● Question 4

0/1 pt 3 99

$$\text{Let } f(x) = \frac{2x^2 - 1x - 10}{2x^2 - 7x + 6}.$$

This function has:

1) A y-intercept at the point

2) x-intercepts at the point(s)

3) Vertical asymptotes at $x =$

4) Horizontal asymptote at $y =$

Question Help: Video Message instructor

● Question 5

0/1 pt 3 99

Find the listed information for the rational function.

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

Reduced $f(x) =$

Domain: $x \neq$ _____

Vertical Asymptote(s):

- There is/are vertical asymptote(s) at .
- There are no vertical asymptotes.
- The VA is even.
- The VA is odd.
- There is no VA.

Hole(s):

There is a hole at .

There is no hole in the function.

x -intercept(s):

There is/are x -intercept(s) at .

There are no x -intercepts.

The degree of the x -intercept is even, meaning the graph will bounce on it.

The degree of the x -intercept is odd, meaning the graph will cross the x -axis at the intercept.

There is no x -intercept.

y -intercept:

There is a y -intercept(s) at .

There are no y -intercepts.

End Behavior:

There is a HA at _____.

$\uparrow\downarrow$

$\downarrow\uparrow$

$\uparrow\uparrow$

$\downarrow\downarrow$

Question Help: [✉ Message instructor](#)

● **Question 6**

0/1 pt [↺ 3](#) [↻ 99](#)

Write an equation for a rational function with:

Vertical asymptotes at $x = -4$ and $x = 1$

x intercepts at $x = 3$ and $x = -5$

y intercept at 10

$y =$

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● **Question 7**

0/1 pt [↺ 3](#) [↻ 99](#)

Write an equation for a rational function with:

Vertical asymptotes at $x = -2$ and $x = 1$

x intercepts at $x = -5$ and $x = -1$

Horizontal asymptote at $y = 6$

$y =$

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● **Question 8**

0/1 pt [↺ 3](#) [↻ 99](#)

Write an equation for a rational function with:

Vertical asymptotes of $x = 4$ and $x = -4$

x intercepts of $(-1,0)$ and $(-6,0)$

Horizontal asymptote of $y = 9$

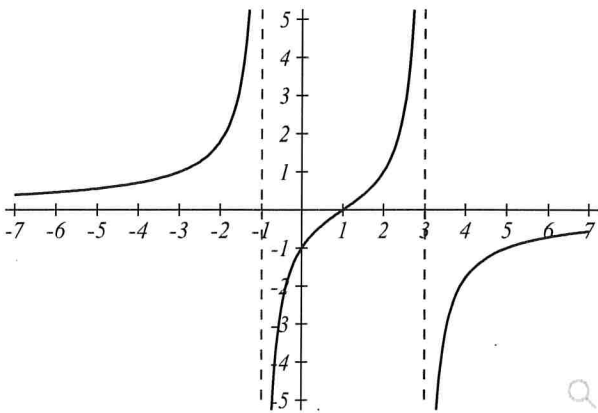
Use y as your output variable.

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● Question 9

0/1 pt 3 99

Write an equation for the function graphed below



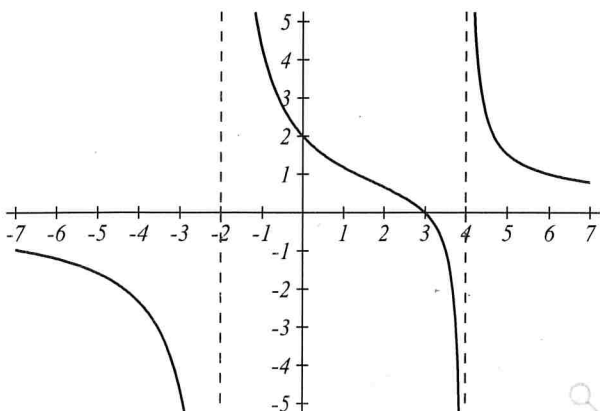
$y =$

Question Help: Video Message instructor

● Question 10

0/1 pt 3 99

Write an equation for the function graphed below



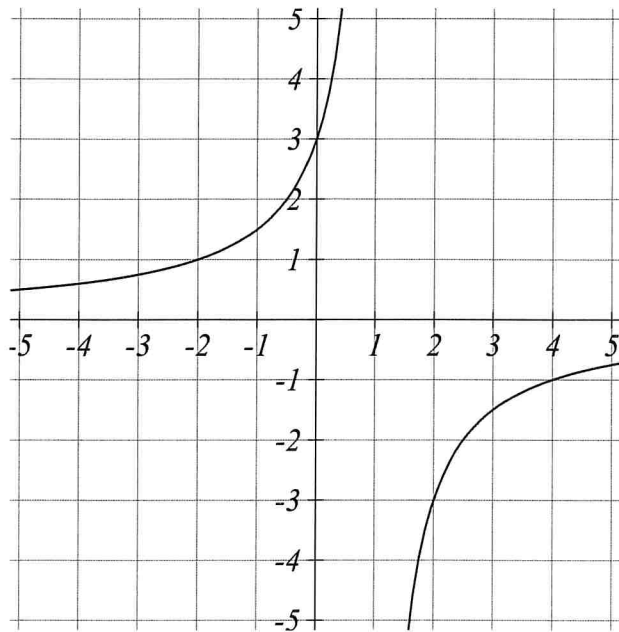
$y =$

Graphing Asymptotes for a Rational Functions

Two copies of the same Rational Function are shown below.

On the graph below draw the Horizontal Asymptote and write the equation for the horizontal asymptote underneath.

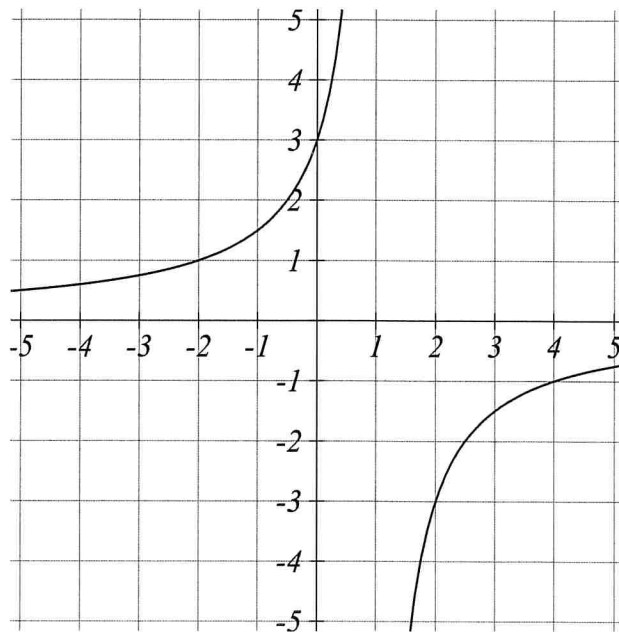
$$f(x) = \frac{-3}{x - 1}$$



Horizontal Asymptote:

On graph below, draw the the Vertical Asymptote and write the equation for the Vertical Asymptot underneath.

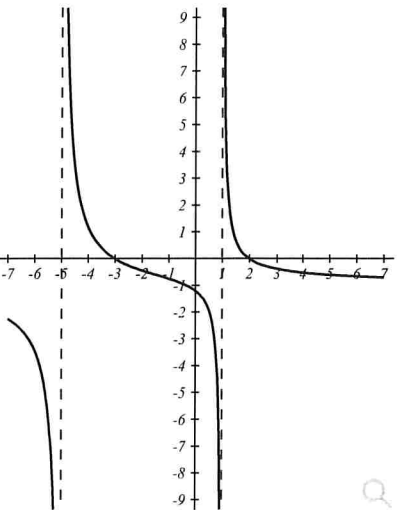
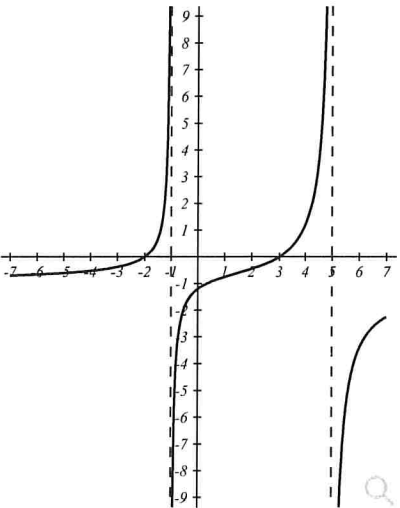
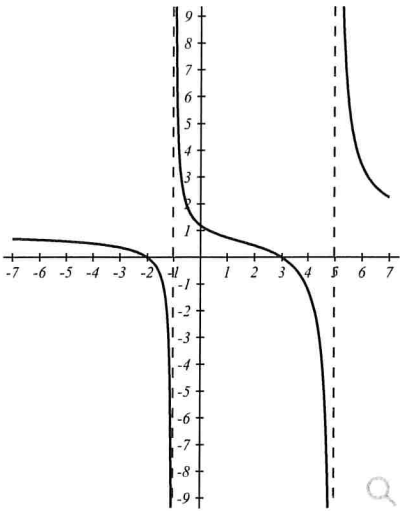
$$f(x) = \frac{-3}{x - 1}$$

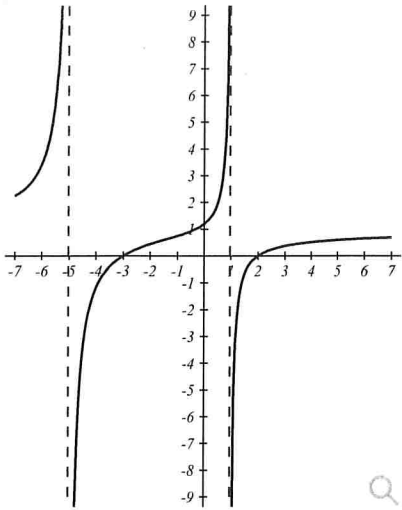


Vertical Asymptote:

Select the choice that is a graph of the function

$$f(x) = \frac{(x + 2)(x - 3)}{(x + 1) \cdot (x - 5)}$$





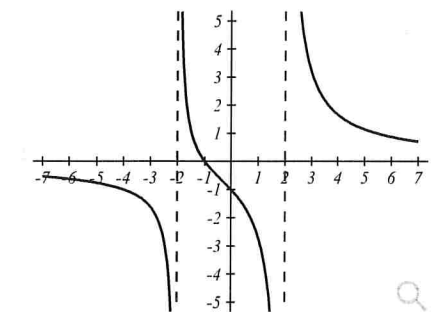
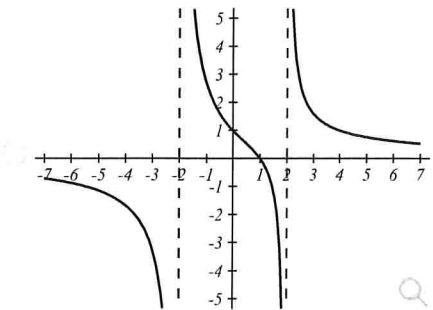
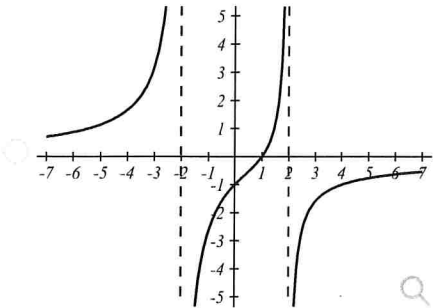
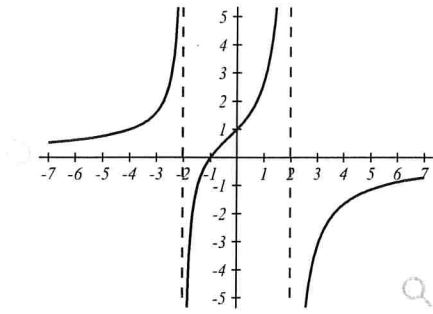
Question Help: Message instructor

● Question 13

0/1 pt 3 99

Select the choice that is a graph of the function

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

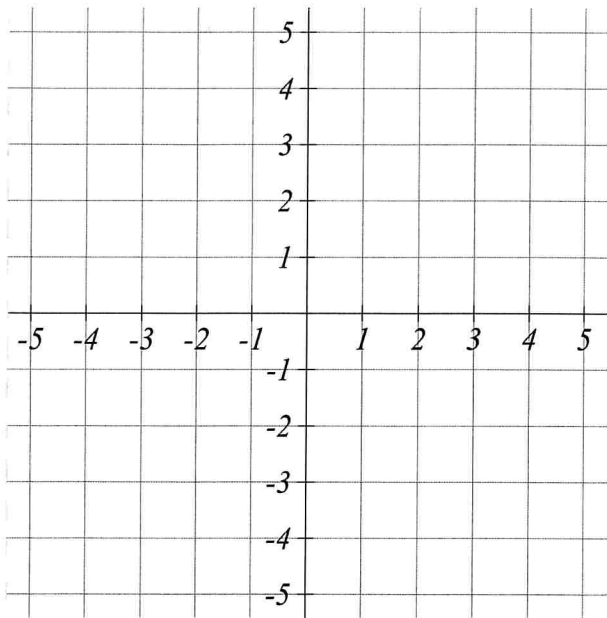


Question Help: Message instructor

● Question 14

0/1 pt 3 99

Draw a graph of $f(x) = \frac{-x + 4}{x - 2}$ by first placing the horizontal and vertical asymptotes, then plotting an additional point on the graph.



Question Help: [▶ Video 1](#) [▶ Video 2](#) [✉ Message instructor](#)

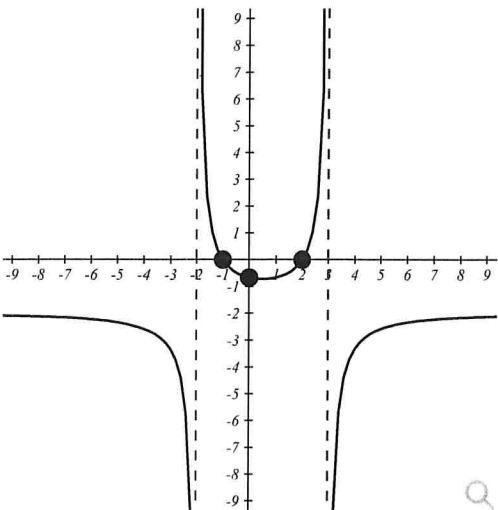
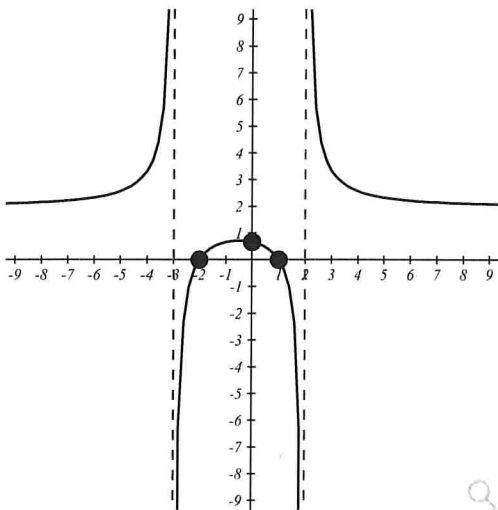
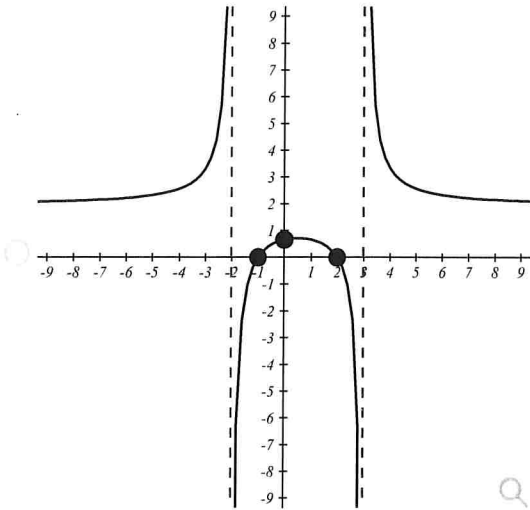
● Question 15

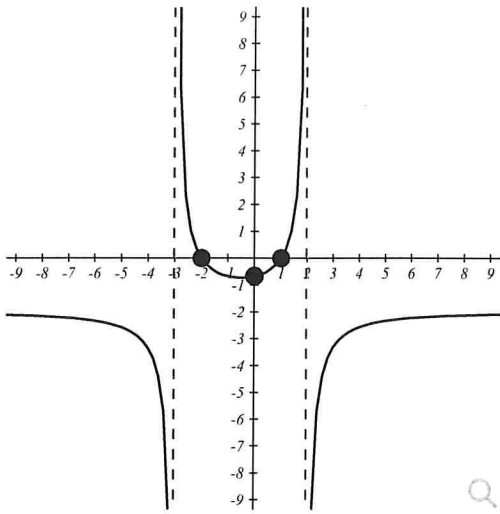
0/1 pt [↶ 3](#) [↷ 99](#)

Select the choice that is a graph of the function

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

Note that the graph also shows the vertical asymptotes, x-intercepts (zeros of the function), and y-intercept.





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