Student: Cole Lamers **Submitted:** 06/21/19 22:29	**Instructor:** Kelly Galarneau **Course:** CA&T Internet (70263) Galarneau	**Assignment:** Practice Quiz 3 (Chapter 3)

1. In the following exercise, find the coordinates of the vertex for the parabola defined by the given quadratic function.

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

The vertex is (1,3). (Type an ordered pair.)

2. The graph of $f(x) = -2(x+3)^2 - 5$ opens down. State whether the statement is true or false.

Choose the correct answer below.

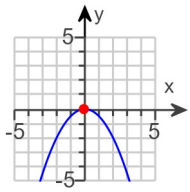
- [x] True
- [ ] False

3. Identify the graph of the following quadratic function.

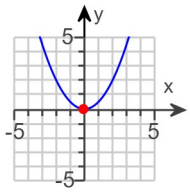
$y = -\frac{1}{2}x^2$

Choose the correct graph below.

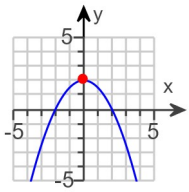
A.



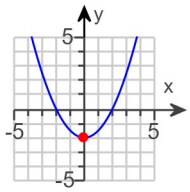
B.



C.



D.

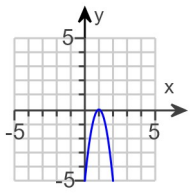


4. Identify the graph of the following quadratic function.

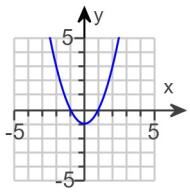
$f(x) = -5(x+1)^2$

Choose the correct graph below.

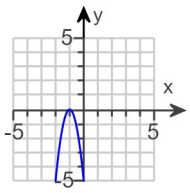
A.



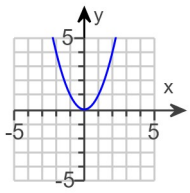
B.



C.



D.



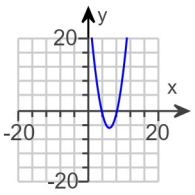
5.

Choose the graph that represents the function.

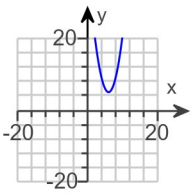
$f(x) = (x - 6)^2 - 5$

Choose the correct graph from the choices on the right.

A.



B.



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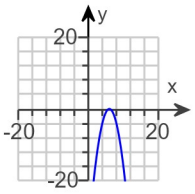

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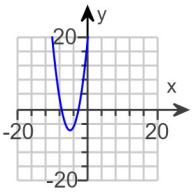
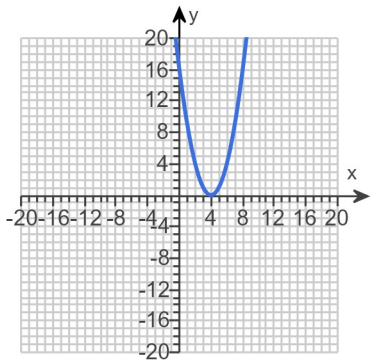


6.

Graph the following function.

$y = (x - 4)^2$

Use the graphing tool to graph the function.



7.

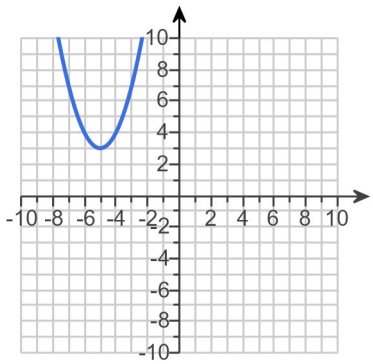
Describe how the given function can be obtained from one of the basic graphs. Then graph the function.

$g(x) = (x + 5)^2 + 3$

Describe how the given function can be obtained from one of the basic graphs.

Start with the graph of $f(x) =$ x^2 . Shift it left 5 units and then shift it up 3 units.

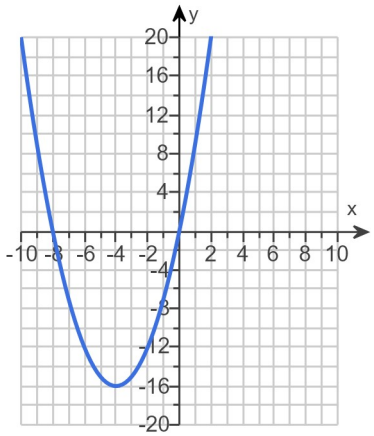
Use the graphing tool to graph the equation.



8.

Graph the given function by writing it in the standard form $y = a(x - h)^2 + k$ and then using transformations on $y = x^2$. Find the vertex, the axis of symmetry, and the x- and y-intercepts.

$y = x^2 + 8x$



Rewrite $y = x^2 + 8x$ in standard form.

$y = (x + 4)^2 - 16$

(Type an equation. Use integers or fractions for any numbers in the equation.)

To graph the given function, shift the graph of $y = x^2$ 4 unit(s) to the left and 16 unit(s) down.

Use the graphing tool to graph the function.

The vertex is $(-4, -16)$.

(Type an ordered pair.)

The axis of symmetry is $x = -4$.

(Type an equation.)

Find the x-intercept(s). Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

- **A.** The x-intercept(s) is/are $x =$ $-8, 0$.
  (Use a comma to separate answers as needed. Type an integer or a fraction.)
- **B.** There are no x-intercepts.

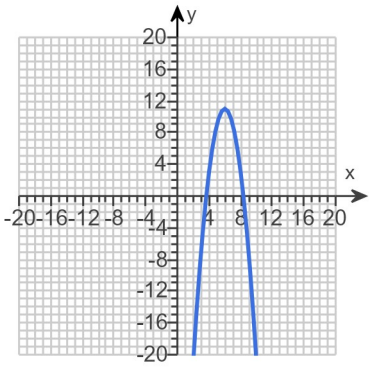
Find the y-intercept. Choose the correct answer below and, if necessary, fill in the answer box to complete your choice.

- **A.** The y-intercept is $y =$ 0.
  (Type an integer or a fraction.)
- **B.** There is no y-intercept.

9.

Graph the given function by writing it in the standard form $y = a(x - h)^2 + k$ and then using transformations on $y = x^2$. Find the vertex, the axis of symmetry, and the x- and y-intercepts.

$y = -2x^2 + 24x - 61$



Write the given function in the standard form $y = a(x - h)^2 + k$.

$y = -2(x - 6)^2 + 11$

(Type an equation. Use integers or fractions for any numbers in the equation.)

Use the graphing tool to graph the equation.

The vertex is at (6,11).

(Type an ordered pair.)

The axis of symmetry is $x = 6$.

(Type an equation.)

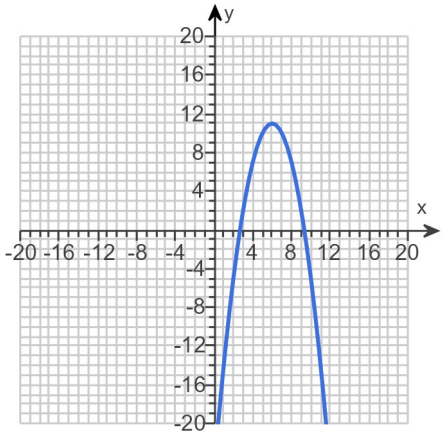
Identify the x-intercept(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The x-intercept(s) is/are $6 + \frac{\sqrt{22}}{2}, 6 - \frac{\sqrt{22}}{2}$.
  (Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)
- **B.** There are no x-intercepts.

Identify the y-intercept. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The y-intercept is $y = -61$.
  (Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)
- **B.** There is no y-intercept.

YOU ANSWERED: $y = -2(x-6)^2 - 11$



$(6, -11)$

A.: $6 + \frac{\sqrt{11}}{2}$

A.: -83

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10. For the given polynomial function f complete parts **(a)** through **(g)**.

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

(a) Describe the end behavior of f. Choose the correct answer below.

- **A.** The graph of f rises left and falls right.
- **B.** The graph of f rises left and rises right.
- **C.** The graph of f falls left and falls right.
- **D.** The graph of f falls left and rises right.

(b) Find the real zeros of f. Determine whether the graph of f crosses or touches but does not cross the x-axis at each x-intercept. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The real zeros of f are $-6,2$.
  (Type an integer or a simplified fraction. Type each solution only once. Use a comma to separate answers as needed.)
- **B.** The function f has no real zeros.

What is the graph's behavior at the smallest x-intercept? Choose the correct answer below.

- **A.** The graph crosses the x-axis.
- **B.** The graph touches but does not cross the x-axis.
- **C.** The function f has no real zeros.

What is the graph's behavior at the largest x-intercept? Choose the correct answer below.

- **A.** The graph crosses the x-axis.
- **B.** The graph touches but does not cross the x-axis.
- **C.** The function f has no real zeros.

(c) Use the zeros of f and test numbers to find the intervals over which the graph of f is above or below the x-axis. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The graph of f is above the x-axis on the interval $(-\infty,-6)\cup(2,\infty)$.
  (Type your answer in interval notation.)
- **B.** The graph of f is not above the x-axis.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The graph of f is below the x-axis on the interval $(-6,2)$.
  (Type your answer in interval notation.)
- **B.** The graph of f is not below the x-axis.

(d) Determine the y-intercept.

The y-intercept is -12.
(Simplify your answer. Type an integer or a fraction.)

(e) Find any symmetries of the graph of the function. Choose the correct answer below.

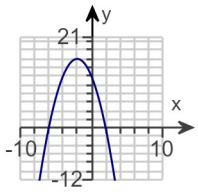
- **A.** The graph has a symmetry about $x=-2$.
  (Type an equation. Simplify your answer. Use integers or fractions for any numbers in the equation.)
- **B.** The graph has y-axis symmetry.

(f) Determine the maximum possible number of turning points.

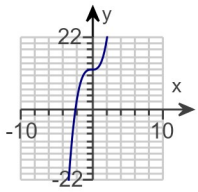
The maximum possible number of turning points is 1.
(Type a whole number.)

(g) Sketch the graph of f. Choose the correct graph below.

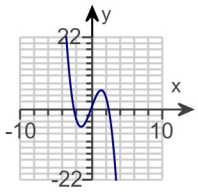
A.



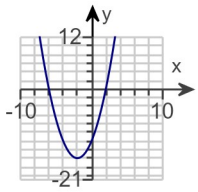
B.



C.



D.



YOU ANSWERED: nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

11. For the given polynomial function f complete parts **(a)** through **(g)**.

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

(a) Describe the end behavior of f. Choose the correct answer below.

- **A.** The graph of f falls left and falls right.
- **B.** The graph of f rises left and rises right.
- **C.** The graph of f rises left and falls right.
- **D.** The graph of f falls left and rises right.

(b) Find the real zeros of f. Determine whether the graph of f crosses or touches but does not cross the x-axis at each x-intercept. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The real zeros of f are 0,3 .
  (Type an integer or a simplified fraction. Type each solution only once. Use a comma to separate answers as needed.)
- **B.** The function f has no real zeros.

What is the graph's behavior at the smallest x-intercept? Choose the correct answer below.

- **A.** The graph crosses the x-axis.
- **B.** The graph touches but does not cross the x-axis.
- **C.** The function f has no real zeros.

What is the graph's behavior at the largest x-intercept? Choose the correct answer below.

- **A.** The graph crosses the x-axis.
- **B.** The graph touches but does not cross the x-axis.
- **C.** The function f has no real zeros.

(c) Use the zeros of f and test numbers to find the intervals over which the graph of f is above or below the x-axis. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The graph of f is above the x-axis on the interval $(-\infty,0)\cup(0,3)\cup(3,\infty)$.
  (Type your answer in interval notation.)
- **B.** The graph of f is not above the x-axis.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The graph of f is below the x-axis on the interval .
  (Type your answer in interval notation.)
- **B.** The graph of f is not below the x-axis.

(d) Determine the y-intercept.

The y-intercept is 0 .
(Simplify your answer. Type an integer or a fraction.)

(e) Find any symmetries of the graph of the function. Choose the correct answer below.

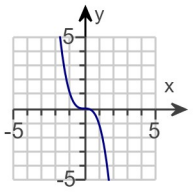
- The graph has origin symmetry.
- The graph has no symmetries.
- The graph has y-axis symmetry.

(f) Determine the maximum possible number of turning points.

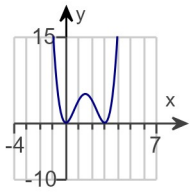
The maximum possible number of turning points is 3.
(Type a whole number.)

(g) Sketch the graph of f. Choose the correct graph below.

A.



B.



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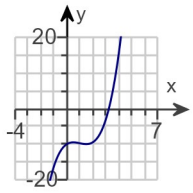
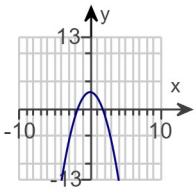


D.



YOU ANSWERED: nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

nothing

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12. List the potential rational zeros of the polynomial function. Do not attempt to find the zeros.

$f(x) = 2x^4 - 8x^3 + x^2 - x + 1$

Choose the answer below that lists the potential rational zeros.

A. $-1, 1, -\frac{1}{2}, \frac{1}{2}, -\frac{1}{8}, \frac{1}{8}$

B. $-1, 1, -2, 2$

C. $-1, 1, -2, 2, -8, 8, -\frac{1}{2}, \frac{1}{2}, -\frac{1}{8}, \frac{1}{8}$

D. $-1, 1, -\frac{1}{2}, \frac{1}{2}$

YOU ANSWERED: nothing

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13. Information is given about a polynomial f(x) whose coefficients are real numbers. Find the remaining zeros of f.

Degree 3; zeros: 2, $-3-i$

Enter the remaining zeros of f.

$-3+i$ (Use a comma to separate answers as needed.)

YOU ANSWERED: nothing

14. Information is given about a polynomial f(x) whose coefficients are real numbers. Find the remaining zeros of f.

Degree 4; zeros: i, $-16+i$

Enter the remaining zeros of f.

$-i, -16-i$ (Use a comma to separate answers as needed.)

YOU ANSWERED: nothing

15. Find the domain of the given rational function.

$$f(x)=\frac{5x}{x^2-8x+12}$$

Domain of f = $(-\infty,2)\cup(2,6)\cup(6,\infty)$
(Type your answer in interval notation.)

YOU ANSWERED: $(-\infty,-6)\cup(-6,-2)\cup(-2,\infty)$

16. Find the domain of the given rational function.

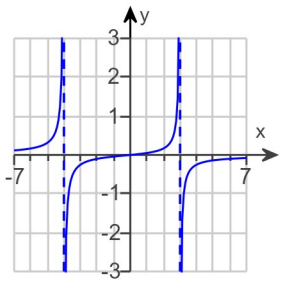
$$f(x)=\frac{6x}{x^2-17x+72}$$

Domain of f = $(-\infty,8)\cup(8,9)\cup(9,\infty)$
(Type your answer in interval notation.)

YOU ANSWERED: $(-\infty,-9)\cup(-9,-8)\cup(-8,\infty)$

17. Use the graph of the rational function to complete the following statement.

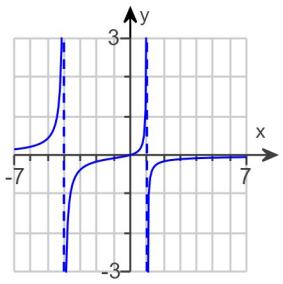
As $x \to -4^+$, $f(x) \to$ ____.



As $x \to -4^+$, $f(x) \to -\infty$.

18. Use the graph of the rational function to complete the following statement.

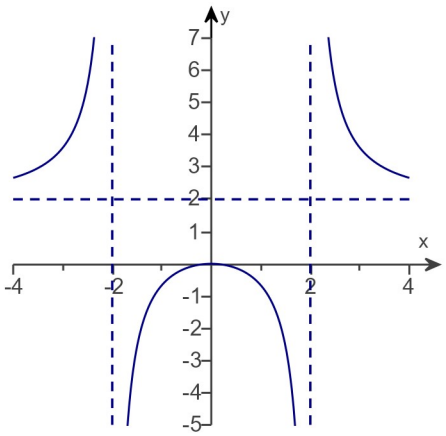
As $x \to \infty$, $f(x) \to$ ____.



As $x \to \infty$, $f(x) \to$ 0 .

19. What are the vertical asymptotes of the graph of f?

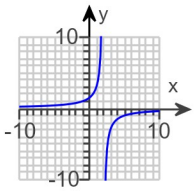
The vertical asymptote(s) is/are $x = -2, x = 2$.
(Type an equation. Use a comma to separate answers as needed.)

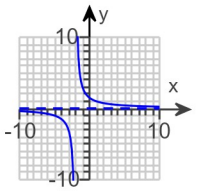


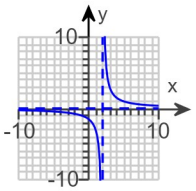
20. Graph the rational function as a translation of $f(x) = \frac{1}{x}$. Identify the vertical and horizontal asymptotes and state the domain and range.

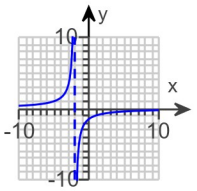
$$f(x) = \frac{3}{x-2}$$

Choose the correct graph below.

A. 

B. 

C. 

D. 

Find the vertical asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $x =$ 2
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. There is no vertical asymptote.

Find the horizontal asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $y =$ 0
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. There is no horizontal asymptote.

The domain of f(x) is $(-\infty,2)\cup(2,\infty)$.
(Type your answer in interval notation.)

The range of f(x) is $(-\infty,0)\cup(0,\infty)$.
(Type your answer in interval notation.)

YOU ANSWERED: nothing
nothing
nothing
nothing

21. Find the vertical asymptotes, if any, of the graph of the rational function.

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

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The vertical asymptote(s) is(are) $x = -7$.
  (Type an equation. Use commas to separate answers as needed.)
- **B.** There are no vertical asymptotes.

YOU ANSWERED: A.: -7

22. Find the vertical asymptotes, if any, of the graph of the following rational function.

$$f(x) = \frac{(x+3)(4x-4)}{(x-7)(x+8)}$$

Select the correct choice below and fill in the answer boxes within your choice, if necessary.

- **A.** The vertical asymptote(s) is/are $x = 7, x = -8$.
  (Type an equation. Use a comma to separate answers as needed.)
- **B.** The graph has no vertical asymptotes.

YOU ANSWERED: nothing

23. Find the horizontal asymptote, if any, of the graph of the following rational function.

$$h(x) = \frac{x^3 - 16}{x^4 + 4}$$

Choose the correct answer below.

- **A.** There is no horizontal asymptote.
- **B.** The horizontal asymptote is at the line $y = 1$.
- **C.** The horizontal asymptote is at the line $y = 0$.
- **D.** The horizontal asymptote is at the line $y = 2$.

YOU ANSWERED: nothing

24. Find the horizontal asymptote, if any, of the graph of the following rational function.

$$f(x) = \frac{7x^4 - 4x + 13}{2x^5 + 5x + 7}$$

Choose the correct answer below.

- **A.** The horizontal asymptote is the line $y = 1$.
- **B.** There is no horizontal asymptote.
- **C.** The horizontal asymptote is the line $y = 0$.
- **D.** The horizontal asymptote is the line $y = 2$.

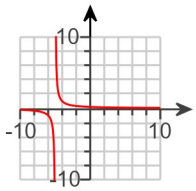
YOU ANSWERED: nothing

25. Graph f(x).

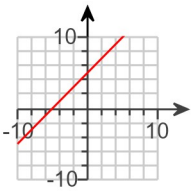
$$f(x) = \frac{1}{x + 5}$$

Choose the correct graph.

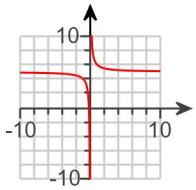
A.



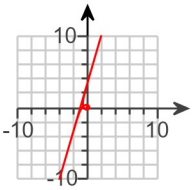
B.



C.



D.

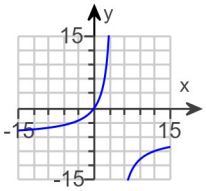


26. Use the six-step procedure to graph the rational function.

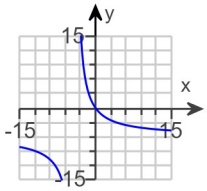
$$f(x) = \frac{6x}{x - 4}$$

Choose the correct answer.

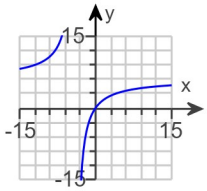
A.



B.



C.



D.