

Unit 2 Test (Lessons 11–22)**Answer all parts of the open response problem.**

- 1) Complete the piecewise function.

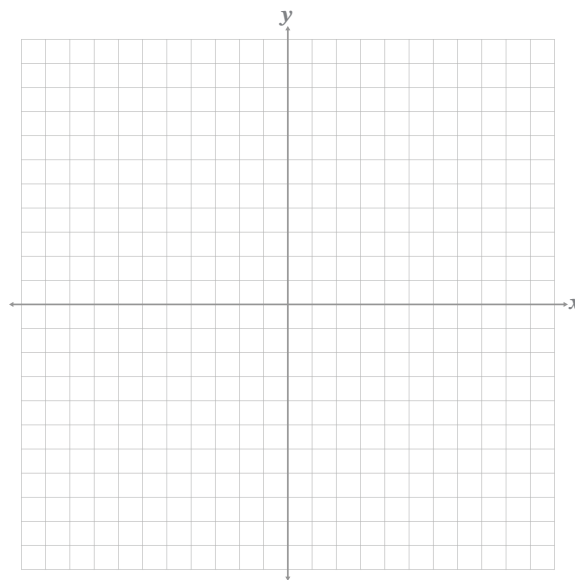
$$f(x) = \begin{cases} \frac{1}{2}(x+7) - 4 & \text{if } -7 \leq x < -3 \\ \text{part A} & \text{if } -3 \leq x \leq 3 \\ \text{part B} & \text{if } x > 3 \end{cases}$$

- A)** Write the equation that transforms the absolute value parent function over the given interval. Vertically stretch the function by a factor of three, shift the function right one and down two from the origin.

- B)** Determine the inverse of the function algebraically.
 $y = (x - 5)^2 + 3$, when $x > 3$

- C)** Graph the piecewise function.

- D)** Name the domain and range.



____ 2) Simplify: $\sqrt[3]{16x^7y^9z^3}$

A) $2x\sqrt[3]{2x^2y^3z}$

B) $2x^2y^3z\sqrt[3]{2x}$

C) $2x^2y^3z$

D) $5x^2y^3z\sqrt[3]{x}$

____ 3) Simplify: i^{86}

A) -1

B) $-i$

C) 1

D) i

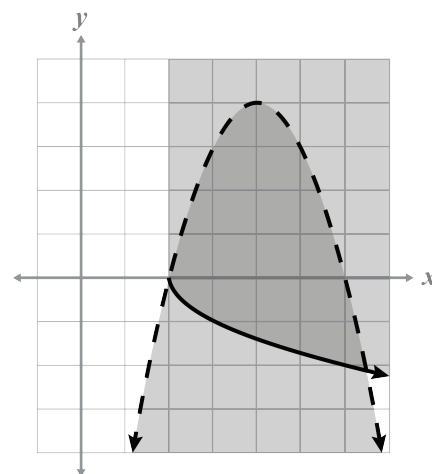
____ 4) Write the system of inequalities for the given graph.

A) $y < -\sqrt{x-4} + 4$
 $y \geq -(x-2)^2$

B) $y \geq -\sqrt{x-4} + 4$
 $y < -(x-2)^2$

C) $y < -\sqrt{x-2}$
 $y \geq -(x-4)^2 + 4$

D) $y \geq -\sqrt{x-2}$
 $y < -(x-4)^2 + 4$



____ 5) Solve $\sqrt{x+5} = x-1$ under the set of real numbers.

A) -1

B) -4

C) 4

D) 1

____ 6) Solve $x^2 = -12$ under the set of complex numbers.

A) $2\sqrt{3}$

B) $\pm 3i\sqrt{2}$

C) $\pm 2i\sqrt{3}$

D) $\pm 2\sqrt{3}$

_____ 7) Select the domain and range that represents the inverse of the graph.

A) domain: $\{x|x \in \mathbb{R}, x \geq 2\}$

range: $\{y|y \in \mathbb{R}, y \geq 1\}$

B) domain: $\{x|x \in \mathbb{R}, x \geq 1\}$

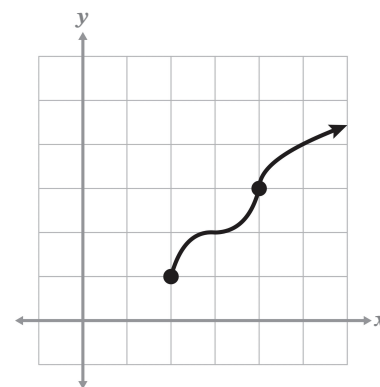
range: $\{y|y \in \mathbb{R}, y \geq 2\}$

C) domain: $\{x|x \in \mathbb{R}\}$

range: $\{y|y \in \mathbb{R}\}$

D) domain: $\{x|x \in \mathbb{R}, x \leq 1\}$

range: $\{y|y \in \mathbb{R}, y \leq 2\}$



_____ 8) Simplify $(6^7 a^3 b^5 c^9)^{\frac{1}{3}}$ in radical form.

A) $6b^2 \sqrt[3]{36abc^3}$

B) $216ab^2c^4 \sqrt[3]{6abc}$

C) $12abc^3 \sqrt[3]{6b^2}$

D) $36abc^3 \sqrt[3]{6b^2}$

_____ 9) Classify the expression: $i\sqrt{-9} + (4i^3)^2$

A) complex

C) real complex

B) real imaginary

D) imaginary

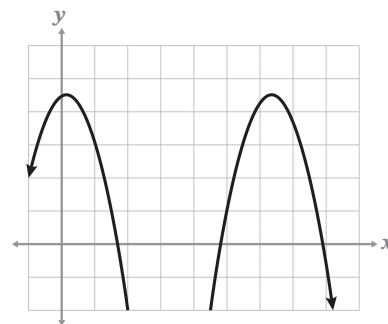
_____ 10) Name the end behavior of the graph.

A) As $x \rightarrow +\infty, f(x) \rightarrow -\infty$, and as $x \rightarrow -\infty, f(x) \rightarrow -\infty$

B) As $x \rightarrow +\infty, f(x) \rightarrow +\infty$, and as $x \rightarrow -\infty, f(x) \rightarrow -\infty$

C) As $x \rightarrow +\infty, f(x) \rightarrow +\infty$, and as $x \rightarrow -\infty, f(x) \rightarrow +\infty$

D) As $x \rightarrow +\infty, f(x) \rightarrow -\infty$, and as $x \rightarrow -\infty, f(x) \rightarrow +\infty$



Use the image to complete problems 11–12.

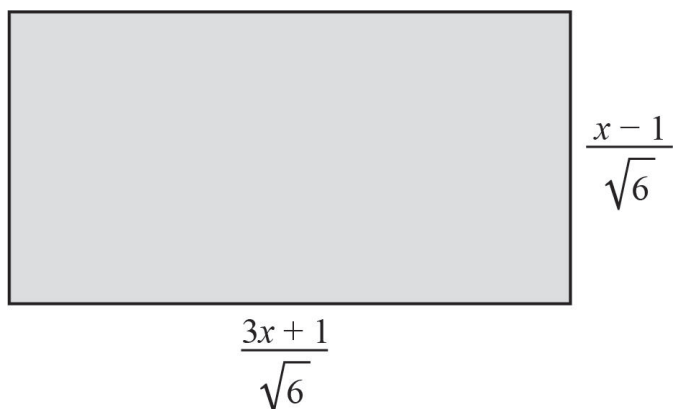
___ 11) Determine the area of the rectangle.

A) $\frac{3x^2 - 2x - 1}{6}$ units²

B) $\frac{3x^2 - 2x - 1}{36}$ units²

C) $\frac{3x^2 - 1}{6}$ units²

D) $\frac{x^2 - 2x - 1}{2}$ units²



___ 12) Determine the perimeter of the rectangle.

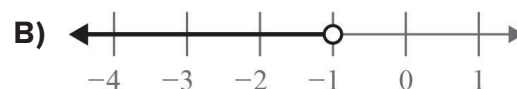
A) $8x$ units

C) $\frac{2x\sqrt{6}}{9}$ units

B) $\frac{4x\sqrt{6}}{3}$ units

D) $\frac{4x\sqrt{3}}{3}$ units

___ 13) Solve $\sqrt{3-x} > 2$ under the set of real numbers.



___ 14) Determine the expression that is equivalent to: $(4i - 3)^2 + 2i(5i + 5)$

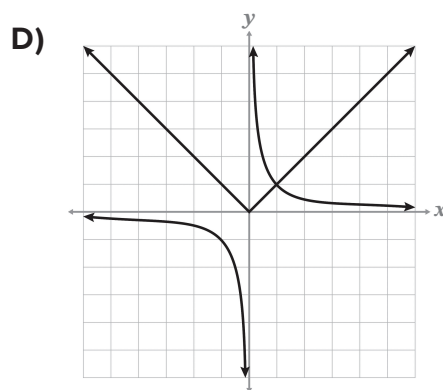
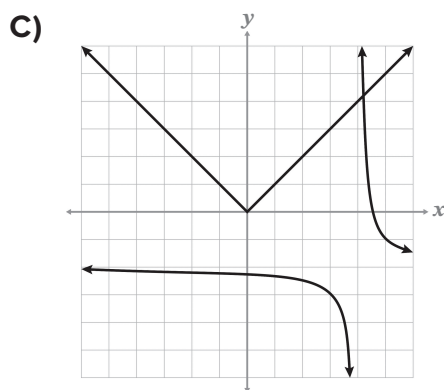
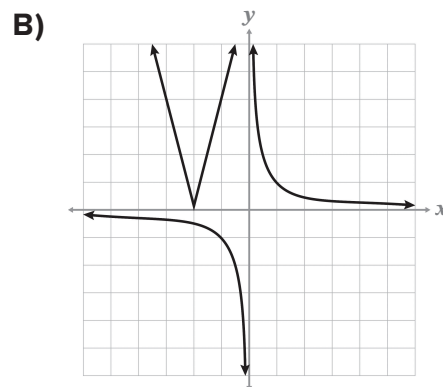
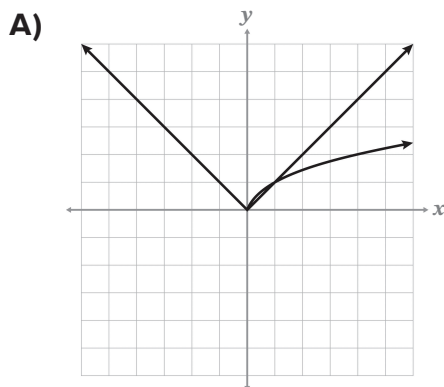
A) $2i(5i + 5) - 7$

B) $(5i - 2)(3i + 4)$

C) $(5i + 2)(3i - 4)$

D) $-10 - 7(1 + 2i)$

- _____ 15) Determine the graph that contains the rational and absolute value parent graph on the same coordinate plane.



- _____ 16) Simplify by rationalizing the denominator: $\frac{4x}{\sqrt{-12} + 3x}$

A) $\frac{8ix\sqrt{3} - 12x^2}{-12 - 9x^2}$

B) $\frac{8ix\sqrt{3} - 12}{-21}$

C) $\frac{8ix\sqrt{3} - 12x^2}{4i^2\sqrt{9} - 9x^2}$

D) $\frac{8ix\sqrt{3} - 12x^2}{12 - 9x^2}$

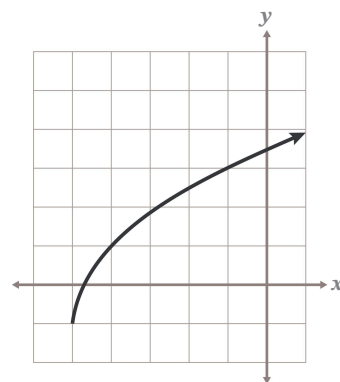
- _____ 17) Determine the inverse of the given graph.

A) $y = 2\sqrt{x+5} - 1$, when $x \geq -5$

B) $y = \frac{1}{2}\sqrt{x-1} + 5$, when $x \geq 1$

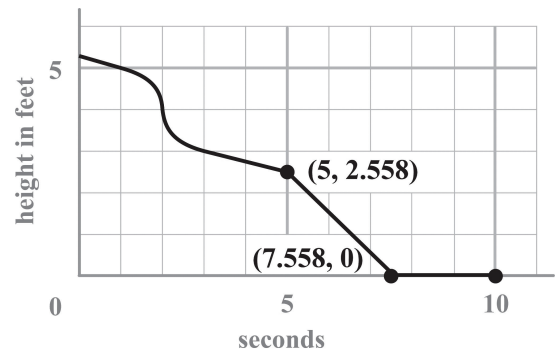
C) $y = \left(\frac{x+1}{2}\right)^2 - 5$, when $x \geq 1$

D) $y = \left(\frac{x+1}{2}\right)^2 - 5$, when $x \geq 5$

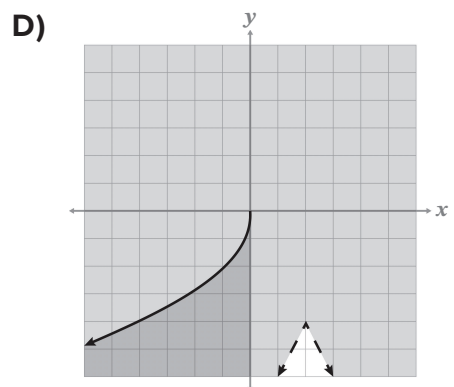
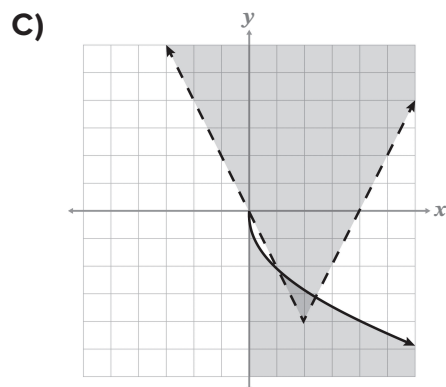
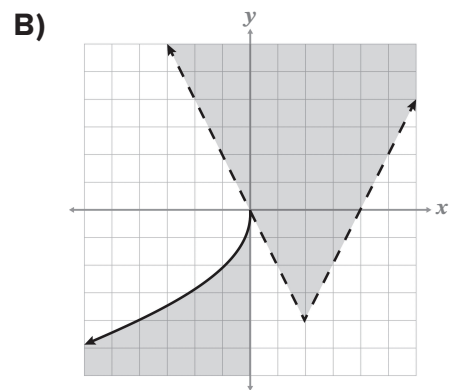
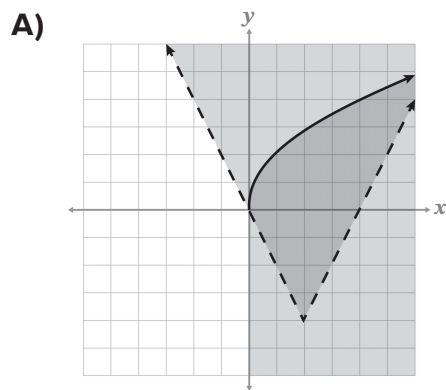


- _____ 18) A marble is released at the top of a track and stops when it gets to the collection area. The graph compares the time in seconds to the height above the ground for one marble's run. Determine the rate of change for the sloped portion of the track.

- A) Decreasing one foot per second
 B) Increasing one foot per second
 C) Decreasing 0.32 feet per second
 D) Decreasing 3.09 feet per second

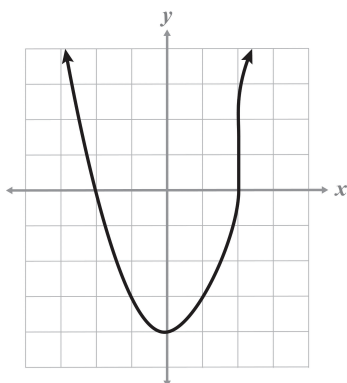


- _____ 19) Determine the graph for the system of inequalities:
 $y \leq -2\sqrt{-x}$
 $y > 2|x - 2| - 4$

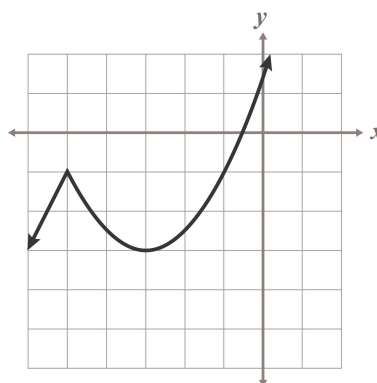


_____ 20) Determine the graph that represents a one-to-one function.

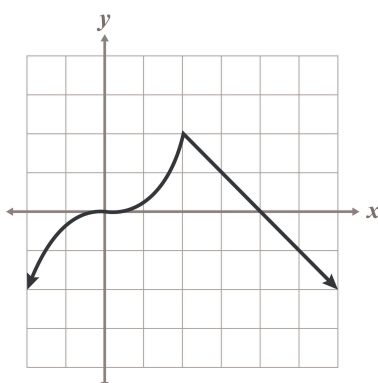
A)



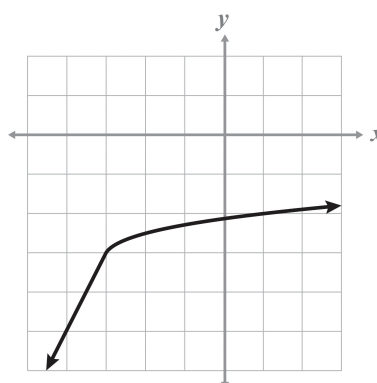
B)



C)



D)



_____ 21) Solve: $(x - 2)^{\frac{3}{2}} = \frac{8}{27}$

A) $-1\frac{5}{9}$

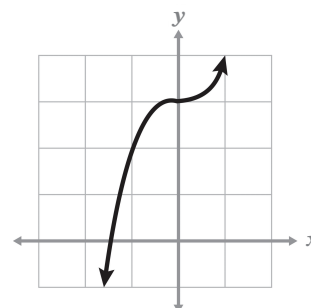
B) $\frac{4}{9}$

C) $2\frac{4}{9}$

D) $\frac{16\sqrt{6}}{243}$

22) A student graphed a function through $(0, 3)$ and knows that as $x \rightarrow +\infty$, $y \rightarrow +\infty$. Select all true statements about the inverse of this function.

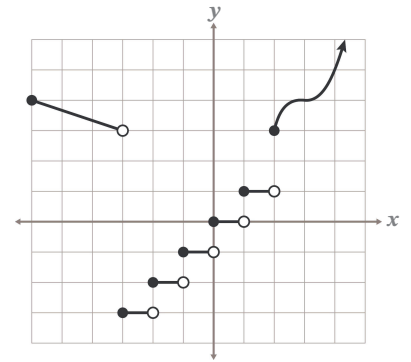
- ☐ The inverse is a cube root.
- ☐ The inverse is a cubic function.
- ☐ As $x \rightarrow -\infty$, $y \rightarrow -\infty$
- ☐ As $x \rightarrow -\infty$, $y \rightarrow +\infty$



23) Select all intervals to complete the piecewise function.

$$f(x) = \begin{cases} -\frac{1}{3}x + 2 & \text{if} \\ \lfloor x \rfloor & \text{if} \\ (x-3)^3 + 4 & \text{if} \end{cases}$$

- ☐ $2 \leq x$
- ☐ $-6 \leq x \leq 2$
- ☐ $-6 \leq x < -3$
- ☐ $-3 \leq x < 2$



24) Select the conjugate pair.

- ☐ $-12 + \sqrt{3x}$
- ☐ $12 + \sqrt{3x}$
- ☐ $-12 - \sqrt{3x}$
- ☐ $-12\sqrt{3x}$

25) Select any ordered pair that is a solution to the system of inequalities.

- ☐ $(-3, 3)$
- ☐ $(5, 7)$
- ☐ $(0, 8)$
- ☐ $(-3, 3.1)$

