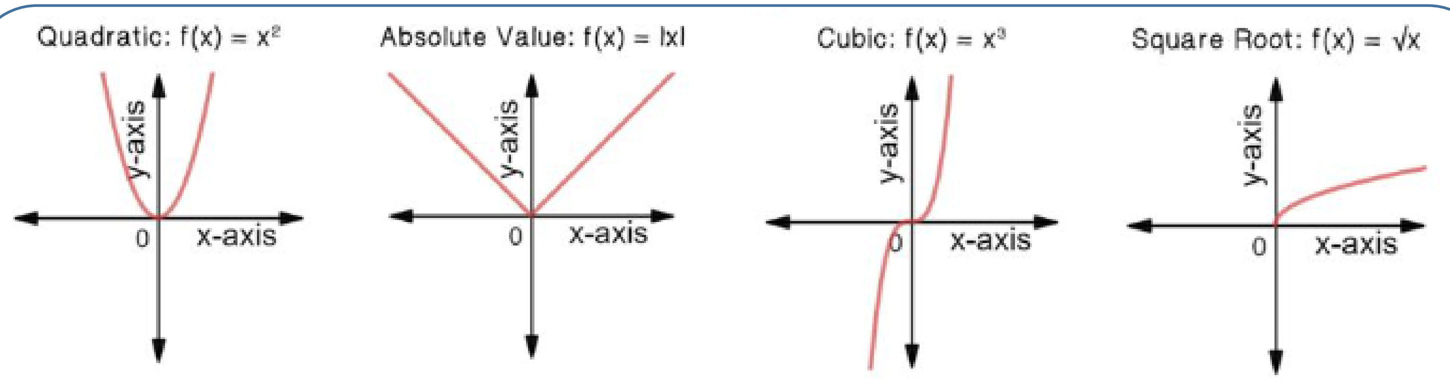
5.2 Polynomial Graph Properties   Algebra 2   THOMPSON



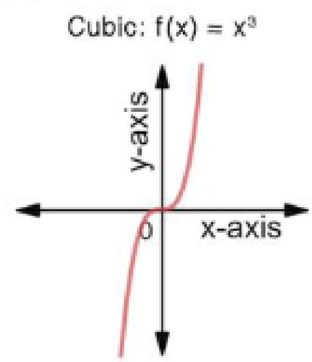
1) Find the zeros of the function.

$y = (x + 4)(x - 6)(x - 7)$ Change signs

The zero(s) of the function are $-4,6,7$. (Use a comma to separate answers as needed.)

2) Find the zeros of the function. Then graph the function.

$y = (x + 3)(x - 5)(x - 6)$ Change signs $y = x^3$

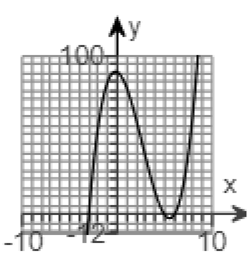


Crosses through

The zero(s) of the function are $-3,5,6$. (Use a comma to separate answers as needed.)

Graph the function. Choose the correct answer below.

A.



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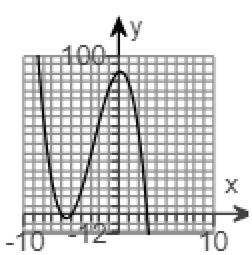

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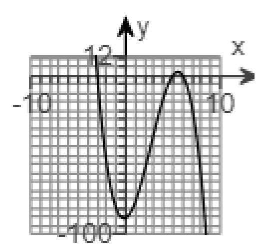

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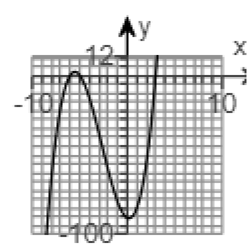
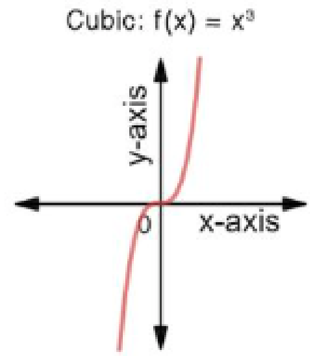


3) Find the zeros of the function. Then graph the function.

$y = (x+3)(x-4)(x-6)$ Change signs $y = x^3$

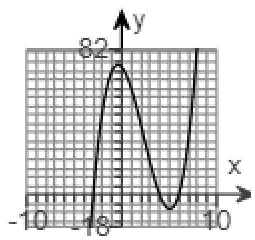


Crosses through

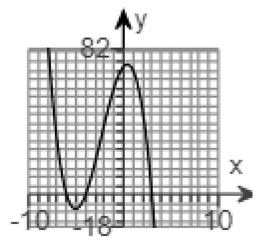
The zero(s) of the function are $-3,4,6$. (Use a comma to separate answers as needed.)

Graph the function. Choose the correct answer below.

A.



B.



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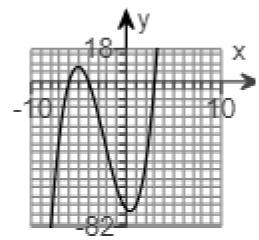

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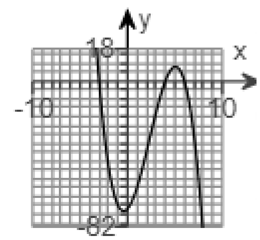
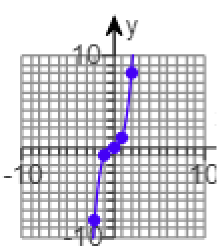


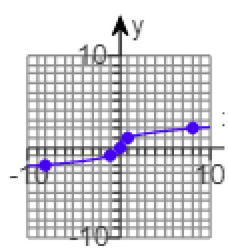
4) Which one is the graph of $f(x) = x^2$? Choose the correct graph below.

Look at box up top

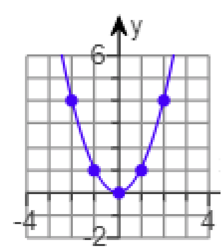
A.



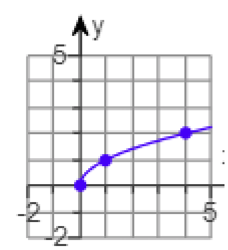
B.



C.



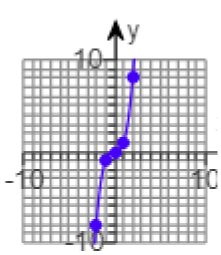
D.



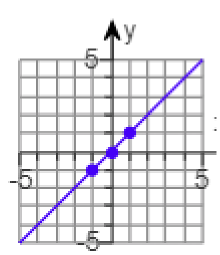
5) Which one is the graph of $f(x) = |x|$? Choose the correct graph below.

Look at box up top

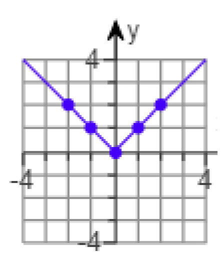
E.



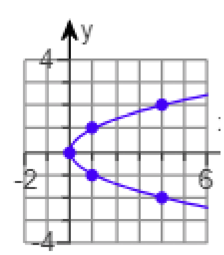
F.



G.

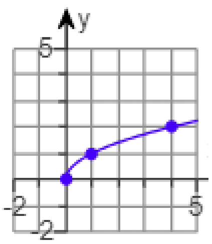


H.

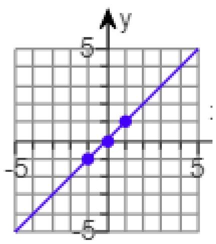


6) Which one is the graph of ?(x) = x^3? Choose the correct graph below.

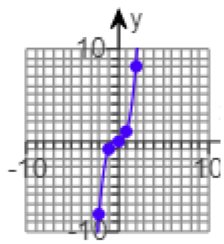
A.



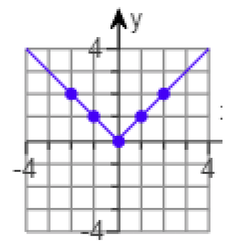
B.



★ C.



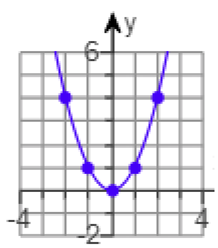
D.



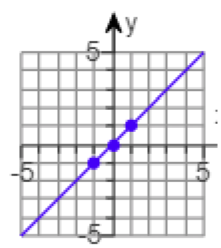
Look at box up top

7) Which one is the graph of f(x) = $\sqrt{x}$? What is its domain?

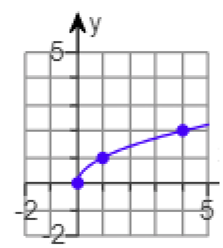
E.



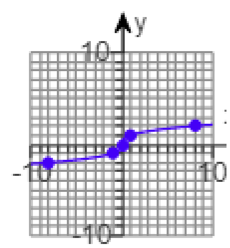
F.



★ G.



H.



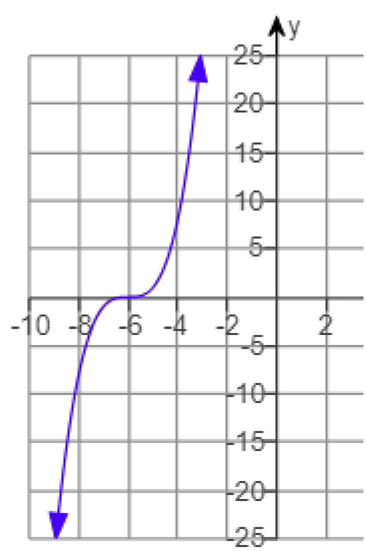
Look at box up top

8) Determine the intervals of the domain over which the function is continuous.

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

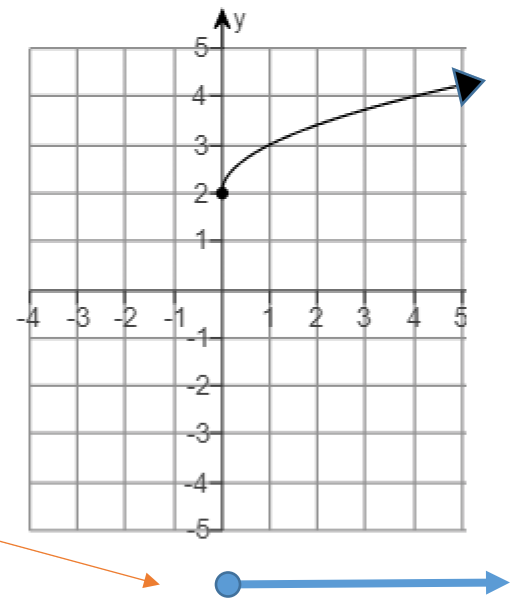
★ A. The function is continuous on $(-\infty,\infty)$.
(Type your answer in interval notation.)

B. The function is not continuous.



Does not have any holes or breaks

9) Determine the intervals of the domain over which function is continuous.



Closed ● means bracket

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

- A. The function is continuous on [0,∞). (Type your answer in interval notation.)
- B. The function is not continuous.

10) For the piecewise linear function, find **(a)** f(−3), **(b)** f(−2), **(c)** f(0), **(d)** f(3), and **(e)** f(5).

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

(a) f(−3) = −9 — x ≤ -2 then 3(-3)

(b) f(−2) = −6 — x ≤ -2 then 3(-2)

(c) f(0) = −4 — x > -2 then (0) - 4

(d) f(3) = −1 — x > -2 then (3) – 4

(e) f(5) = 1 — x > -2 then (5) - 4

11) Use the piecewise-defined function to find the following values for f(x).

$$f(x) = \begin{cases} 4 - 5x & \text{if } x \le 0 \\ 4x & \text{if } 0 < x < 7 \\ 5x + 5 & \text{if } x \ge 7 \end{cases}$$

$f(-3) =$ 19 — $x \le 0$ then 4 - 5(-3)

$f(-1) =$ 9 — $x \le 0$ then 4 - 5(-1)

$f(1) =$ 4 — $0 < x < 7$ then 4(1)

$f(3) =$ 12 — $0 < x < 7$ then 4(3)

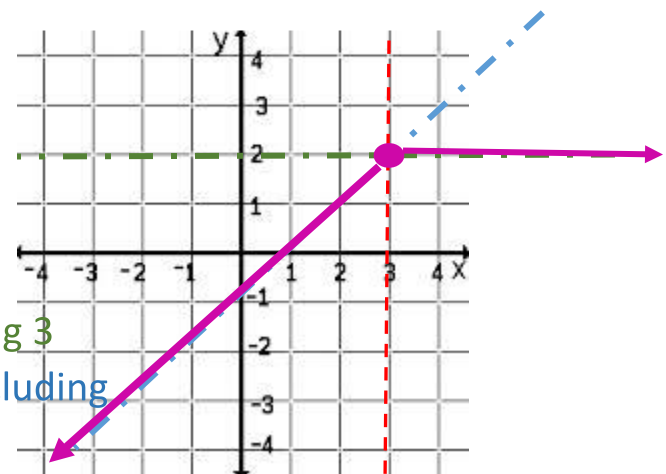
$f(7) =$ 40 — $x \ge 7$ then 5(7) + 5

12) Graph the piecewise-defined function.

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

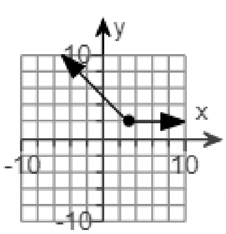
$x - 1$ if $x \le 3$: To the left of 3, including 3

2 if $x > 3$: to the right of 3, not including

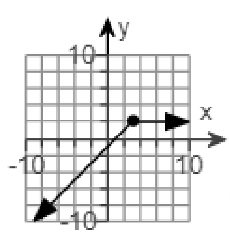


Choose the correct graph.

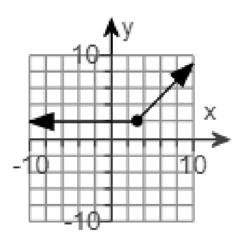
A.



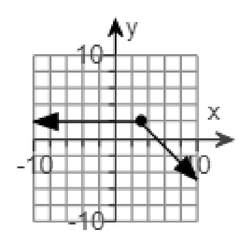
B.



C.



D.

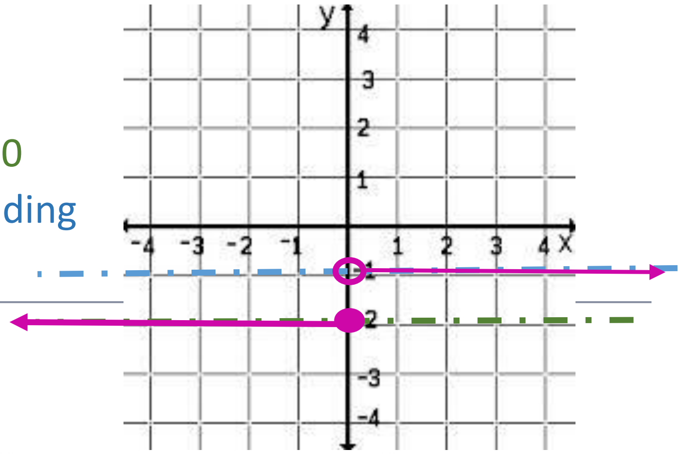


13) Graph the following piecewise function.

$f(x) = \begin{cases} -2 & \text{if } x \le 0 \\ -1 & \text{if } x > 0 \end{cases}$

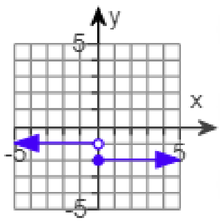
To the left of 0, including 0

to the right of 3, not including

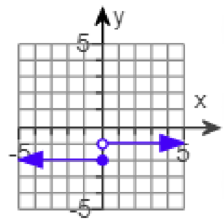


Choose the correct graph below.

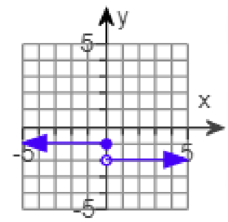
A.



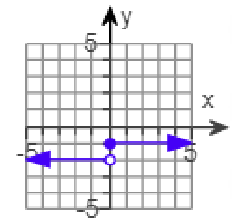
★B.



C.



D.



14) To graph the function $f(x) = x^2 - 21$, shift the graph of $y = x^2$ down 21 units.

15) To graph the function $f(x) = x^2 + 18$, shift the graph of $y = x^2$ up 18 units.

16) The graph of the function $f(x) = (x + 10)^2$ is obtained by shifting the graph of $y = x^2$ to the left 10 units.

17) The graph of the function $f(x) = (x - 3)^2$ is obtained by shifting the graph of $y = x^2$ to the right 3 units.

18) The graph of $f(x) = -\sqrt{x}$ is a reflection of the graph of $y = \sqrt{x}$ across the x-axis.

19) The graph of $f(x) = \sqrt{-x}$ is a reflection of the graph of $y = \sqrt{x}$ across the y-axis.

20) To obtain the graph of $f(x) = (x + 9)^3 - 6$, shift the graph of $y = x^3$ to the left 9 units and down 6 units.

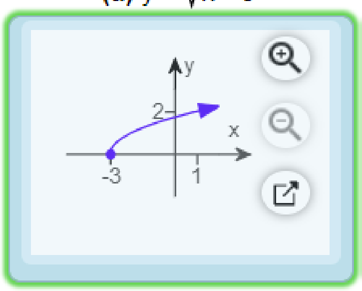
21) To obtain the graph of $f(x) = (x-2)^3 + 10$, shift the graph of $y = x^3$ to the right 2 units and up 10 units.

22) Drag each description given above to the appropriate area below depending on the transformation of the function $y = x^2$.

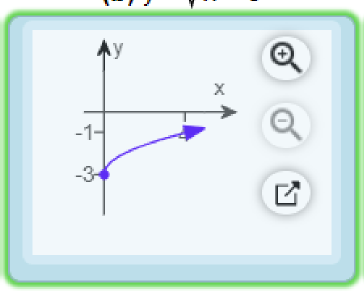
I	II
(a) $y = (x-9)^2$	a translation to the right 9 units
(b) $y = x^2 - 9$	a translation down 9 units
(c) $y = 9x^2$	a vertical stretching by a factor of 9
(d) $y = (x+9)^2$	a translation to the left 9 units
(e) $y = x^2 + 9$	a translation up 9 units

23)

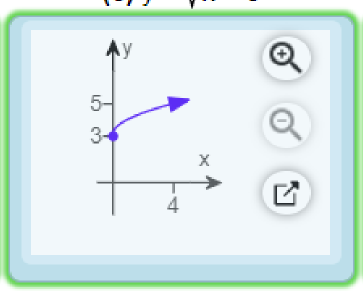
(a) $y = \sqrt{x+3}$



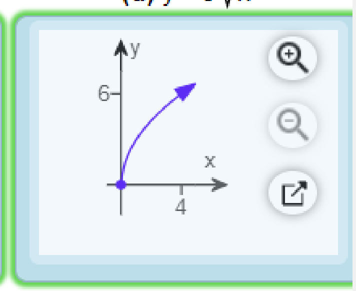
(b) $y = \sqrt{x} - 3$



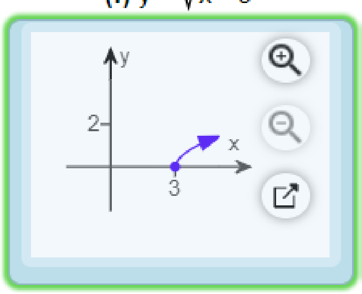
(c) $y = \sqrt{x} + 3$



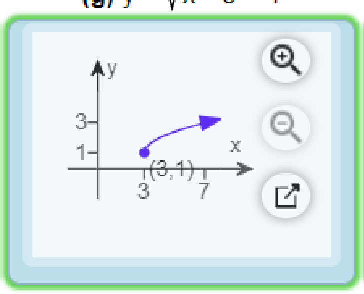
(d) $y = 3\sqrt{x}$



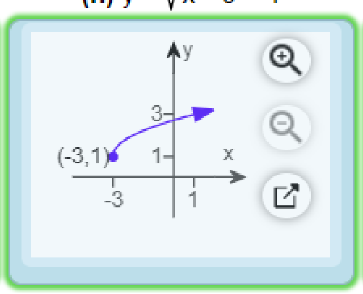
(f) $y = \sqrt{x-3}$



(g) $y = \sqrt{x-3} + 1$



(h) $y = \sqrt{x+3} + 1$



(i) $y = \sqrt{x-3} - 1$