

LESSON **11.3** Skills Practice

Name _____ Date _____

Walking the . . . Curve? Domain, Range, Zeros, and Intercepts

Vocabulary

Choose the term that best completes each sentence.

zeros	vertical motion model	interval	open interval
closed interval	half-closed interval	half-open interval	

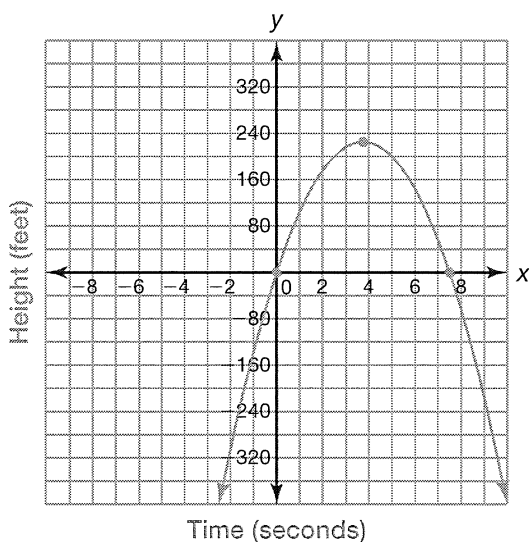
1. An _____ is defined as the set of real numbers between two given numbers.
2. The x -intercepts of a graph of a quadratic function are also called the _____ of the quadratic function.
3. An _____ (a, b) describes the set of all numbers between a and b , but not including a or b .
4. A _____ or _____ $(a, b]$ describes the set of all numbers between a and b , including b but not including a . Or, $[a, b)$ describes the set of all numbers between a and b , including a but not including b .
5. A quadratic equation that models the height of an object at a given time is a _____.
6. A _____ $[a, b]$ describes the set of all numbers between a and b , including a and b .



Problem Set

Graph the function that represents each problem situation. Identify the absolute maximum, zeros, and the domain and range of the function in terms of both the graph and problem situation. Round your answers to the nearest hundredth, if necessary.

1. A model rocket is launched from the ground with an initial velocity of 120 feet per second. The function $g(t) = -16t^2 + 120t$ represents the height of the rocket, $g(t)$, t seconds after it was launched.



Absolute maximum: (3.75, 225)

Zeros: (0, 0), (7.5, 0)

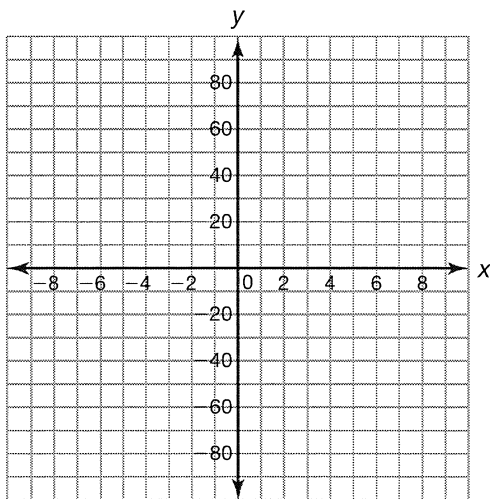
Domain of graph: The domain is all real numbers from negative infinity to positive infinity.

Domain of the problem: The domain is all real numbers greater than or equal to 0 and less than or equal to 7.5.

Range of graph: The range is all real numbers less than or equal to 225.

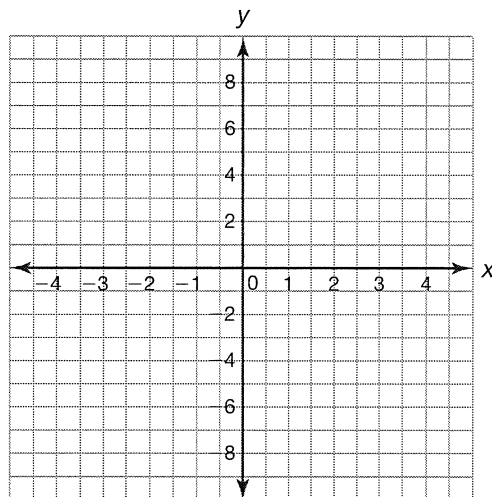
Range of the problem: The range is all real numbers less than or equal to 225 and greater than or equal to 0.

2. A model rocket is launched from the ground with an initial velocity of 60 feet per second. The function $g(t) = -16t^2 + 60t$ represents the height of the rocket, $g(t)$, t seconds after it was launched.



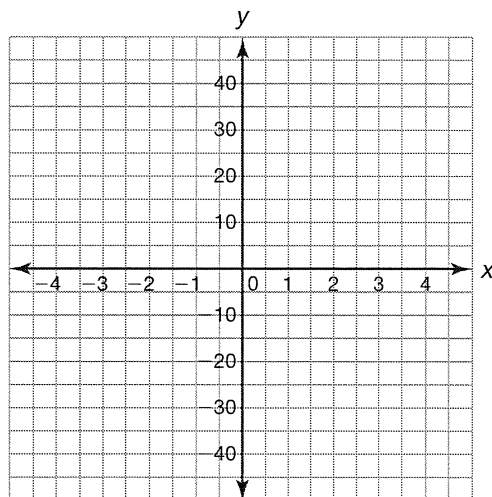
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3. A baseball is thrown into the air from a height of 5 feet with an initial vertical velocity of 15 feet per second. The function $g(t) = -16t^2 + 15t + 5$ represents the height of the baseball, $g(t)$, t seconds after it was thrown.

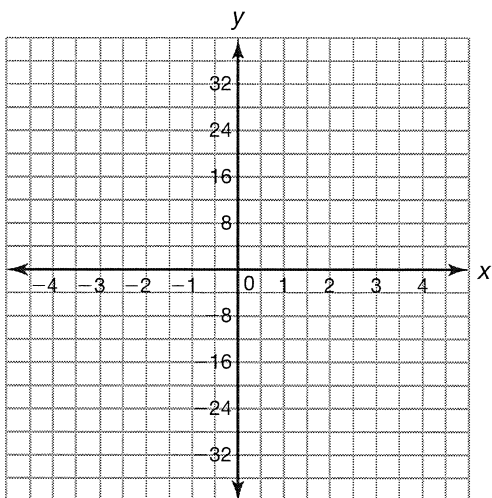


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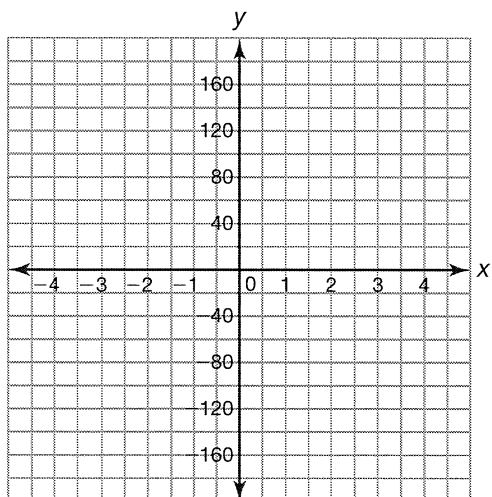
4. A football is thrown into the air from a height of 6 feet with an initial vertical velocity of 50 feet per second. The function $g(t) = -16t^2 + 50t + 6$ represents the height of the football, $g(t)$, t seconds after it was thrown.



5. A tennis ball is dropped from a height of 25 feet. The initial velocity of an object that is dropped is 0 feet per second. The function $g(t) = -16t^2 + 25$ represents the height of the tennis ball, $g(t)$, t seconds after it was dropped.



6. A tennis ball is dropped from a height of 150 feet. The initial velocity of an object that is dropped is 0 feet per second. The function $g(t) = -16t^2 + 150$ represents the height of the tennis ball, $g(t)$, t seconds after it was dropped.



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Use interval notation to represent each interval described.

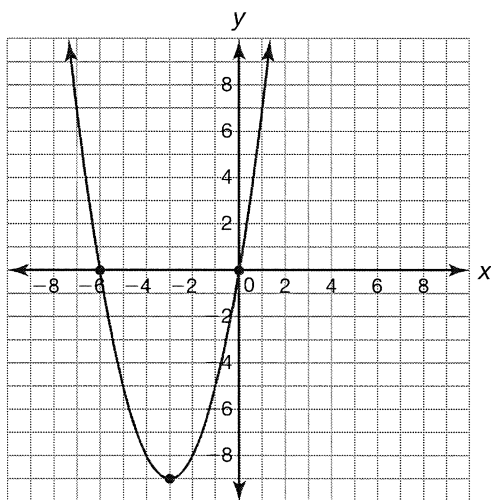
7. All real numbers greater than or equal to -3 but less than 5 .
 $[-3, 5)$
8. All real numbers greater than or equal to -100 .
9. All real numbers greater than -36 and less than or equal to 14 .
10. All real numbers less than or equal to b .
11. All real numbers greater than or equal to c and less than or equal to d .
12. All real numbers greater than or equal to n .

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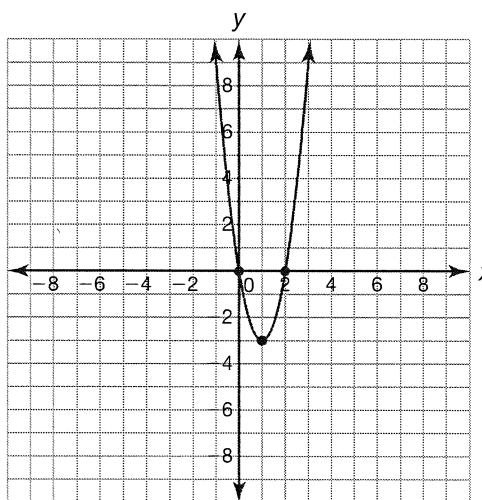
Identify the intervals of increase and decrease for each function.

13. $f(x) = x^2 + 6x$

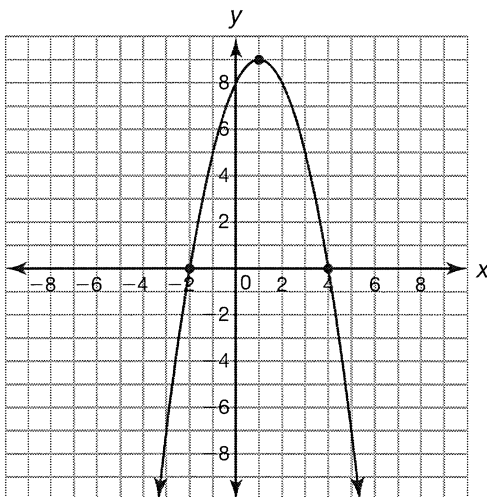
14. $f(x) = 3x^2 - 6x$



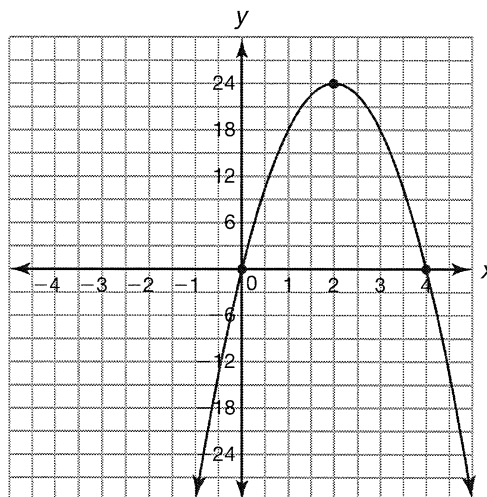
Interval of increase: $(-3, \infty)$
 Interval of decrease: $(-\infty, -3)$



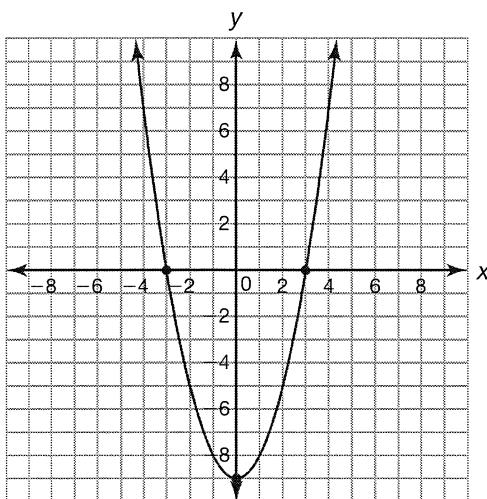
15. $f(x) = -x^2 + 2x + 8$



16. $f(x) = -6x^2 + 24x$



17. $f(x) = x^2 - 9$



18. $f(x) = x^2 - 4x + 6$

