

LESSON 3.2 Skills Practice

Name _____ Date _____

**Polynomial Power
Power Functions****Vocabulary**

Choose the term from the box that best completes each statement.

even function	end behavior	symmetric about a point
power function	symmetric about a line	odd function

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1. A function is _____ if the line divides the graph into two identical parts.
2. The _____ of a graph of a function is the behavior of the graph as x approaches infinity and as x approaches negative infinity.
3. A(n) _____ has a graph symmetric about the origin, thus $f(x) = -f(-x)$.
4. A function is _____ if each point on the graph has a point the same distance from the central point but in the opposite direction.
5. A(n) _____ has a graph symmetric about the y -axis, thus $f(x) = f(-x)$.
6. A(n) _____ is a function of the form $P(x) = ax^n$, where n is a non-negative integer.

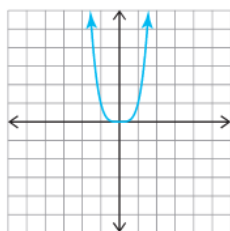
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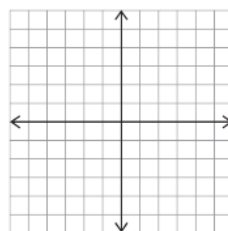
Problem Set

Sketch the graph of $f(x)$ and describe the end behavior of each graph.

1. x^4



2. x^3

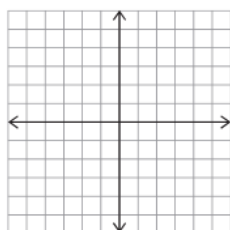


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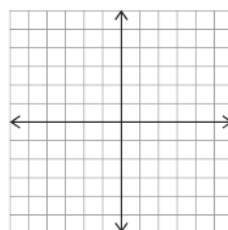
As $x \rightarrow \infty, f(x) \rightarrow \infty$

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

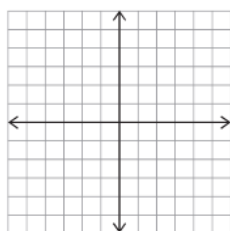
3. x^{20}



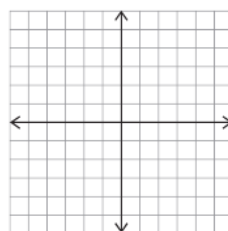
4. x^{25}



5. $-x^5$



6. $-x^2$



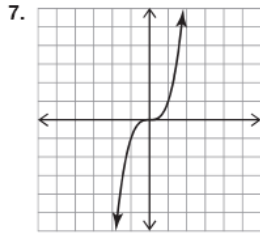
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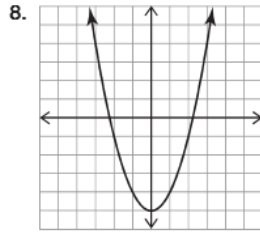
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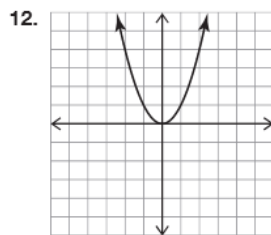
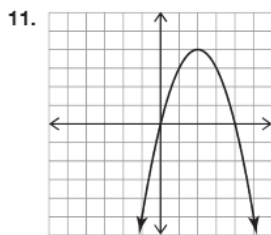
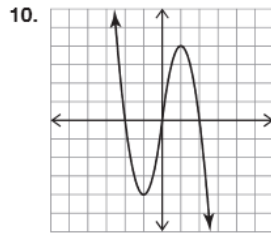
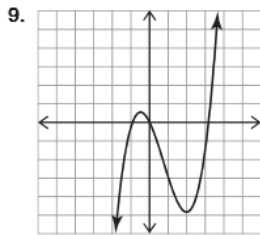
Determine whether the function represented by each graph is even, odd, or neither. Explain your reasoning.



The function is odd because it is symmetrical about the origin.



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Determine algebraically whether each function is even, odd, or neither.

13. $f(x) = x^3 - 4x + 3$

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

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

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

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

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

$f(x) \neq f(-x)$ or $-f(x)$ thus $f(x)$ is neither even nor odd.

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14. $f(x) = 2x^4 - x^2 + 9$

15. $f(x) = 5x^2 + 13$

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16. $f(x) = 4x^3 - 6$

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17. $f(x) = 3x^5 - x$

18. $f(x) = -2x^7 + 5x^9 + x$