

LESSON 3.3 Skills Practice

Name _____ Date _____

Function Makeover
Transformations and Symmetry of Polynomial Functions

Vocabulary

Provide an example of each term.

1. polynomial function

2. quartic function

3. quintic function

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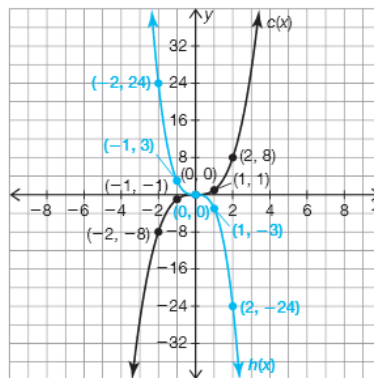
Problem Set

Use reference points and symmetry to complete the table of values for each function. Then, graph the function on the coordinate plane. State whether the function is odd, even, or neither.

1. $c(x) = x^3$; $h(x) = -3c(x)$

Reference Points on $c(x)$	→	Corresponding Points on $h(x)$
(0, 0)	→	(0, 0)
(1, 1)	→	(1, -3)
(2, 8)	→	(2, -24)

The function $h(x)$ is an odd function.

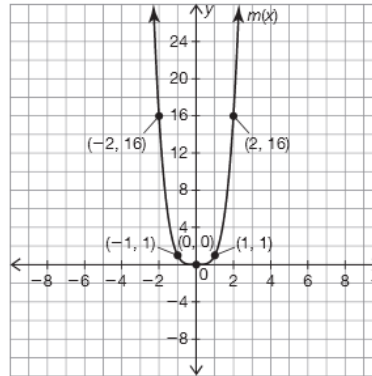


LESSON 3.3 Skills Practice

page 2

2. $m(x) = x^2$; $n(x) = m(x) + 4$

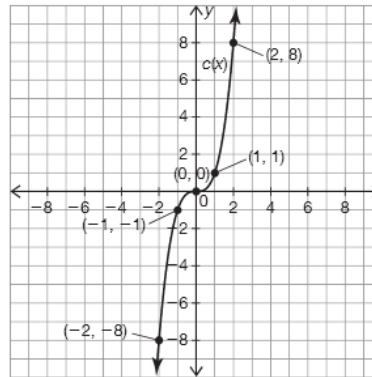
Reference Points on $m(x)$	→	Corresponding Points on $n(x)$
(0, 0)	→	
(1, 1)	→	
(2, 16)	→	



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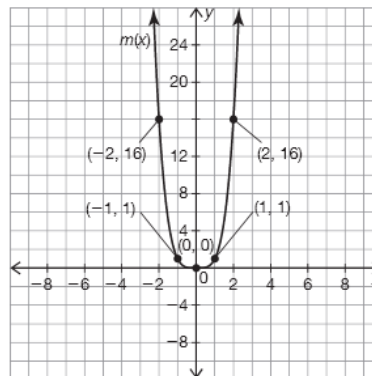
3. $c(x) = x^3$; $g(x) = \frac{1}{4}c(x)$

Reference Points on $c(x)$	→	Corresponding Points on $g(x)$
(0, 0)	→	
(1, 1)	→	
(2, 8)	→	



4. $m(x) = x^2$; $p(x) = m(x) - 1$

Reference Points on $m(x)$	→	Corresponding Points on $p(x)$
(0, 0)	→	
(1, 1)	→	
(2, 16)	→	



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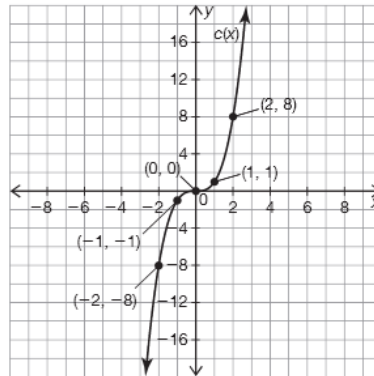
LESSON 3.3 Skills Practice

page 3

Name _____ Date _____

5. $c(x) = x^3$; $d(x) = c(x) - 3$

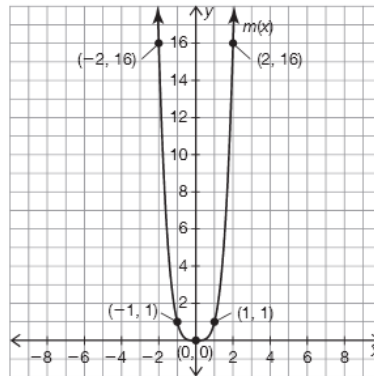
Reference Points on $c(x)$	→	Corresponding Points on $g(x)$
(0, 0)	→	
(1, 1)	→	
(2, 8)	→	



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6. $m(x) = x^2$; $t(x) = m(-2x)$

Reference Points on $m(x)$	→	Corresponding Points on $n(x)$
(0, 0)	→	
(1, 1)	→	
(2, 16)	→	

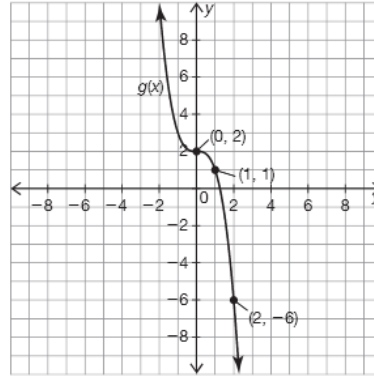
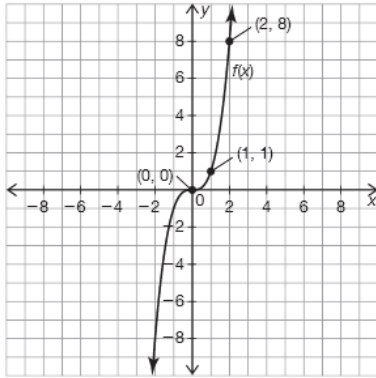


LESSON 3.3 Skills Practice

page 4

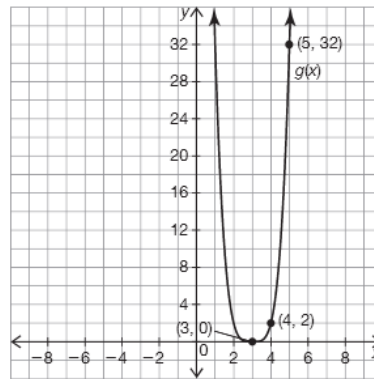
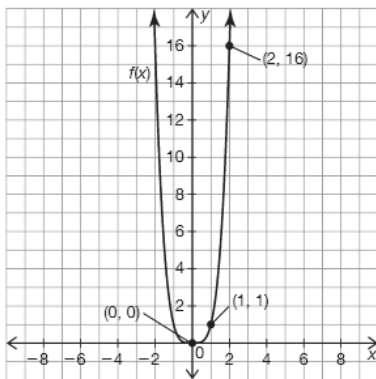
Analyze the graphs of $f(x)$ and $g(x)$. Write an equation for $g(x)$ in terms of $f(x)$.

7. $g(x) = -f(x) + 2$



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8. $g(x) =$



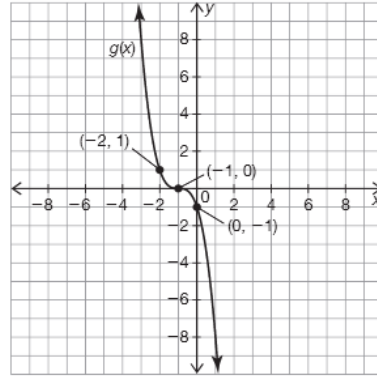
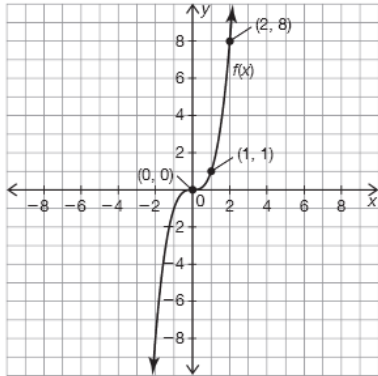
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LESSON 3.3 Skills Practice

page 5

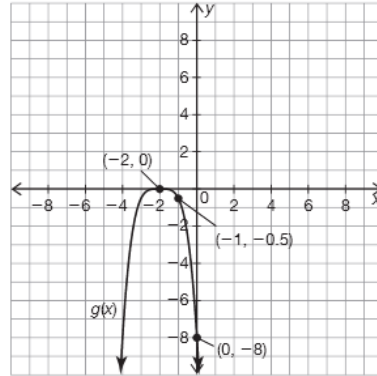
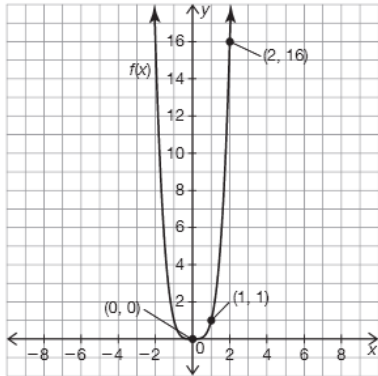
Name _____ Date _____

9. $g(x) =$



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10. $g(x) =$

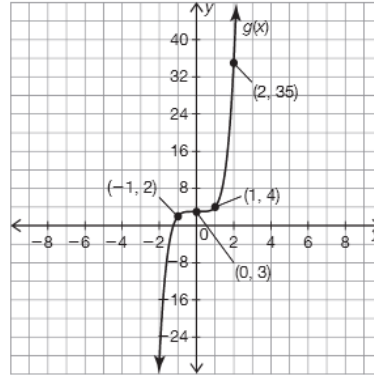
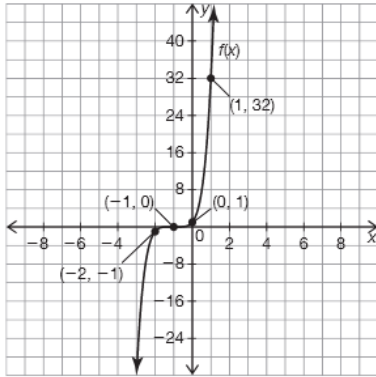


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LESSON 3.3 Skills Practice

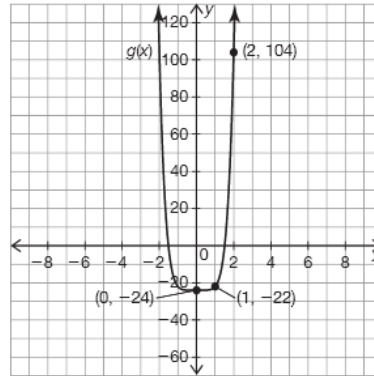
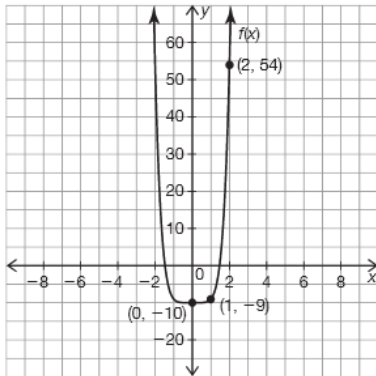
page 6

11. $g(x) =$



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12. $g(x) =$



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LESSON 3.3 Skills Practice

page 7

Name _____ Date _____

The equation for a polynomial function $p(x)$ is given. The equation for the transformed function $m(x)$ in terms of $p(x)$ is also given. Describe the transformation(s) performed on $p(x)$ that produced $m(x)$. Then, write a specific equation for $m(x)$.

13. $p(x) = x^4$; $m(x) = -p(0.5x) + 2$
 $(x, y) \rightarrow (2x, -y + 2)$

The graph of the function $m(x)$ is stretched horizontally by a factor of 2, translated 2 units up and reflected about the line $y = 2$.

$$m(x) = -p(0.5x) + 2$$
$$= -(0.5x)^4 + 2$$

3

14. $p(x) = x^3$; $m(x) = 4p(x - 3) - 5$

15. $p(x) = x^5$; $m(x) = 0.5p(-x) + 4$

LESSON 3.3 Skills Practice

page 8

16. $p(x) = x^3; m(x) = -p(x + 5)$

3

17. $p(x) = x^4; m(x) = 2p(-x - 2)$

18. $p(x) = x^5; m(x) = p(x + 4) - 1$

LESSON 3.3 Skills Practice

page 9

Name _____ Date _____

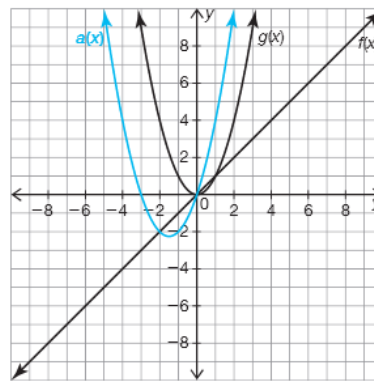
Use each basic power function shown to complete the table of values and sketch $a(x)$ on the coordinate plane. Then, write a specific equation for $a(x)$.

$f(x) = x$	$g(x) = x^2$	$h(x) = x^3$	$j(x) = x^4$	$k(x) = x^5$
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19. $a(x) = g(x) + 3f(x)$

x	$g(x)$	$f(x)$	$a(x)$
-2	4	-2	-2
-1	1	-1	-2
0	0	0	0
1	1	1	4
2	4	2	10

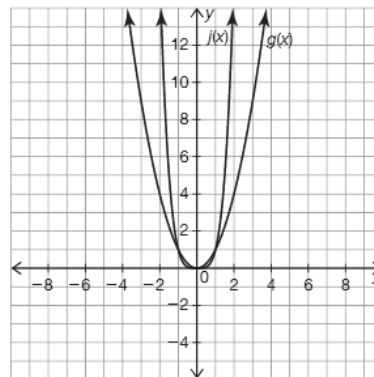
$a(x) = x^2 + 3x$



3

20. $a(x) = 0.5j(x) - g(x)$

x	$j(x)$	$g(x)$	$a(x)$
-2			
-1			
0			
1			
2			

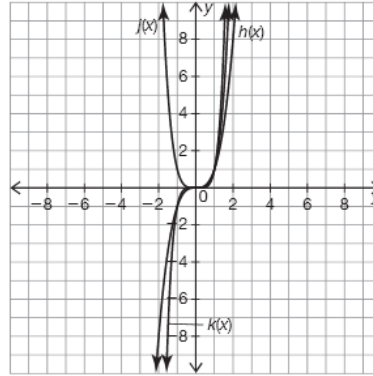


LESSON 3.3 Skills Practice

page 10

21. $a(x) = k(x) + 2j(x) - h(x)$

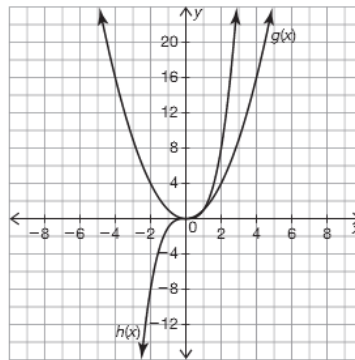
x	k(x)	j(x)	h(x)	a(x)
-3				
-2				
-1				
0				
1				
2				
3				



3

22. $a(x) = -h(x) + 5g(x) + 4$

x	h(x)	g(x)	a(x)
-2			
-1			
0			
1			
2			



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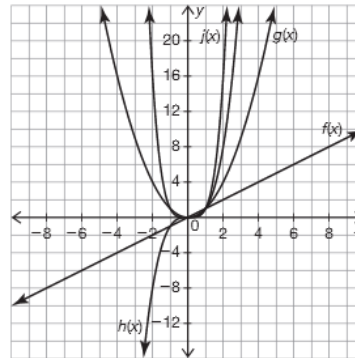
LESSON 3.3 Skills Practice

page 11

Name _____ Date _____

23. $a(x) = j(x) - 0.5h(x) - 6g(x) + f(x)$

x	j(x)	h(x)	g(x)	f(x)	a(x)
-3					
-2					
-1					
0					
1					
2					
3					



3

24. $a(x) = 2h(x) + 3g(x) - 2f(x) - 5$

x	h(x)	g(x)	f(x)	a(x)
-3				
-2				
-1				
0				
1				
2				
3				

