

Name _____ Period _____ Date _____

READY

Topic: Properties of exponents

Use properties of exponents to simplify the following. Write your answers in exponential form with positive exponents.

1. $\sqrt[3]{x^2} \cdot \sqrt[3]{x^3}$
 $= \sqrt[3]{x^5} = x^{5/3}$

4. $\sqrt[5]{32} \cdot \sqrt{9} \cdot \sqrt[3]{27}$
 $= 2 \cdot 3 \cdot 3$
 $= 2 \cdot 3^2$

7. $(7^2)^{-1}$
 $= 7^{-2} = \frac{1}{7^2}$

2. $\sqrt[3]{x} \cdot \sqrt[4]{x} \cdot \sqrt[5]{x}$
 $= x^{1/3} \cdot x^{1/4} \cdot x^{1/5}$
 $= x^{4/60} \cdot x^{15/60} \cdot x^{12/60} = x^{31/60}$

5. $\sqrt[4]{8} \cdot \sqrt[3]{16} \cdot \sqrt[5]{2}$
 $= 2^{3/4} \cdot 2^{4/3} \cdot 2^{1/5}$
 $= 2^{9/20} \cdot 2^{10/15} \cdot 2^{4/20} = 2^{31/20}$

8. $(3^{-4})^{-5}$
 $= 3^{20}$

3. $\sqrt[6]{a} \cdot \sqrt[3]{a^2} \cdot \sqrt[5]{b^3}$
 $= a^{1/6} \cdot a^{2/3} \cdot b^{3/5}$
 $= a^{5/6} \cdot a^{4/6} \cdot b^{3/5} = a^{9/6} \cdot b^{3/5} = a^{3/2} \cdot b^{3/5}$

6. $(5^2)^3$
 $= 5^6$

9. $\left(\frac{5^{-4}}{5^2}\right)^3$
 $= \left(\frac{1}{5^6}\right)^3 = \frac{1}{5^{18}}$

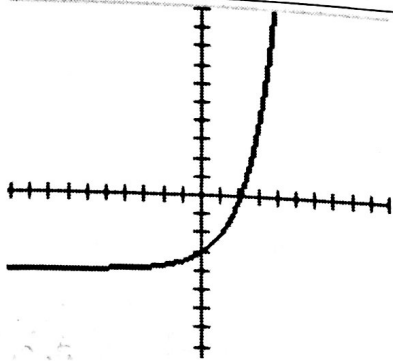
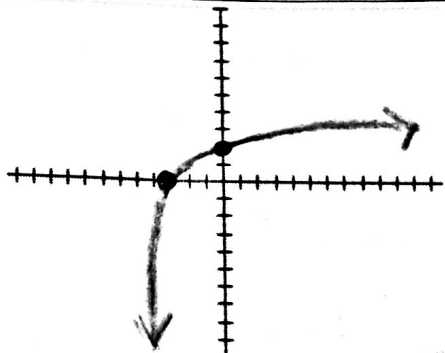
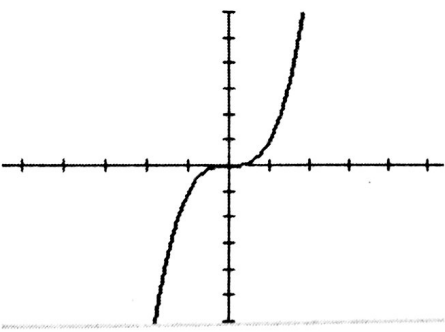
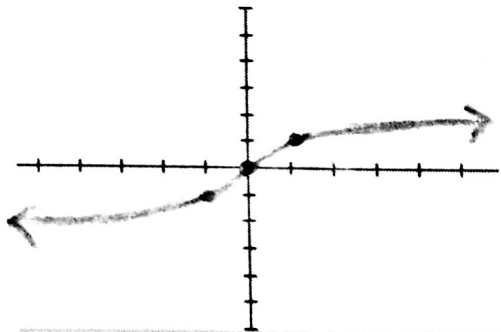
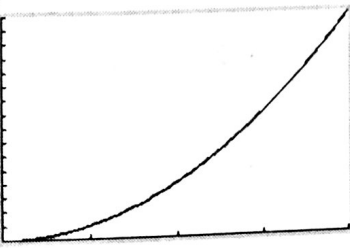
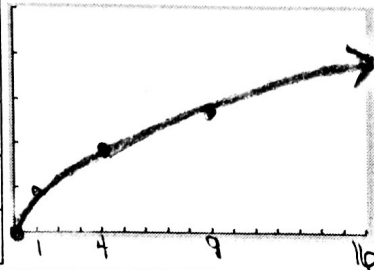
SET

Topic: Representations of inverse functions

Write the inverse of the given function in the same format as the given function.

Function $f(x)$		Inverse $f^{-1}(x)$	
10.			
x	f(x)	x	f ⁻¹ (x)
-8	0	0	-8
-4	3	3	-4
0	6	6	0
4	9	9	4
8	12	12	8

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11. 																									
12. $f(x) = -2x + 4$	$f^{-1}(x) = \frac{x-4}{-2}$ $\text{or } f^{-1}(x) = -\frac{1}{2}x + 2$																								
13. $f(x) = \log_3 x$	$f^{-1}(x) = 3^x$																								
14. 																									
15. <table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th>x</th> <th>f(x)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>4</td></tr> <tr><td>3</td><td>9</td></tr> <tr><td>4</td><td>16</td></tr> </tbody> </table> 	x	f(x)	0	0	1	1	2	4	3	9	4	16	<table border="1" style="display: inline-table; margin-right: 20px;"> <thead> <tr> <th>x</th> <th>f^{-1}(x)</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>4</td><td>2</td></tr> <tr><td>9</td><td>3</td></tr> <tr><td>16</td><td>4</td></tr> </tbody> </table> 	x	f^{-1}(x)	0	0	1	1	4	2	9	3	16	4
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GO

Topic: Factoring Quadratic Expressions

Factor the following.

16. $2x^2 + 3x - 9$

$$\begin{aligned} &= 2x^2 + 6x - 3x - 9 \\ &= 2x(x+3) - 3(x+3) \\ &= (2x-3)(x+3) \end{aligned}$$

17. $3x^2 - 8x + 4$

$$\begin{aligned} &= 3x^2 - 6x - 2x + 4 \\ &= 3x(x-2) - 2(x-2) \\ &= (3x-2)(x-2) \end{aligned}$$

18. $9x^2 - 16$

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

19. $7x^2 - 31x - 20$

$$\begin{aligned} &= 7x^2 - 35x + 4x - 20 \\ &= 7x(x-5) + 4(x-5) \\ &= (7x+4)(x-5) \end{aligned}$$

20. $7k^2 + 63k$

$$= 7k(k+9)$$

21. $2x^2 + 17x + 21$

$$\begin{aligned} &= 2x^2 + 14x + 3x + 21 \\ &= 2x(x+7) + 3(x+7) \\ &= (2x+3)(x+7) \end{aligned}$$

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