

## UNIT 3-LESSON 5

READY // SET // GO

Name \_\_\_\_\_

Period \_\_\_\_\_

Date \_\_\_\_\_

### READY

Topic: Ordering numbers

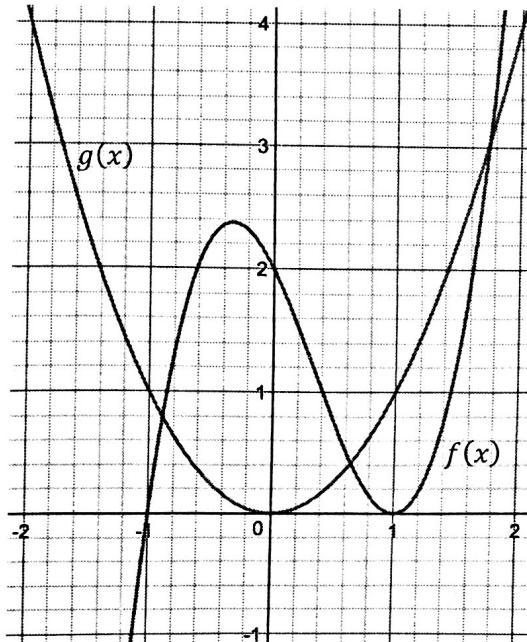
**Order the numbers from least to greatest.**

1.  $100^3 = 1000000$     $\sqrt{100} = 10$     $\log_2 100$     $2^{10} = 1024$   
**Answer:**  $\log_2 100, \sqrt{100}, 100, 2^{10}, 100^3$
2.  $2^{-\frac{1}{2}} = \frac{1}{\sqrt{2}}$     $-\sqrt{100} = -10$     $\log_2 \left(\frac{1}{8}\right) = -3$     $0$     $(-2)^1 = -2$   
**Answer:**  $-\sqrt{100}, \log_2 \left(\frac{1}{8}\right), (-2)^1, 0, 2^{-\frac{1}{2}}$
3.  $2^0 = 1$     $\sqrt{25} = 5$     $\log_2 8 = 3$     $2(x^0), x \neq 0 = 2$     $(2)^{-\frac{1}{2}} = \frac{1}{\sqrt{2}}$   
**Answer:**  $(2)^{-\frac{1}{2}}, 2^0, 2(x^0), \log_2 8, \sqrt{25}$
4.  $\log_3 3^3 = 3$     $\log_5 5^{-2} = -2$     $\log_6 6^0 = 0$     $\log_4 4^{-1} = -1$     $\log_2 2^3 = 3$   
**Answer:**  $\log_5 5^{-2}, \log_4 4^{-1}, \log_6 6^0, \text{The } \log_3 3^3; \log_2 2^3$

Refer to the given graph to answer the questions.

Insert  $>$ ,  $<$ , or  $=$  in each statement to make it true.

5.  $f(0) \underline{\quad} g(0)$
6.  $f(2) \underline{\quad} g(2)$
7.  $f(-1) \underline{\quad} g(-1)$
8.  $f(1) \underline{\quad} g(-1)$
9.  $f(5) \underline{\quad} g(5)$
10.  $f(-2) \underline{\quad} g(-2)$



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SECONDARY MATH III // MODULE 3  
POLYNOMIAL FUNCTIONS - 3.8

**SET**

Topic: Finding the roots and factors of a polynomial

Use the given root to find the remaining roots. Then write the function in factored form.

Function	Roots	Factored form
11. $f(x) = x^3 - 13x^2 + 52x - 60$ $x^3 - 8x^2 + 12x \leftarrow \text{Factor}$ $x - 5 \cancel{ } x^3 - 13x^2 + 52x - 60$ $+ (x^3 - 5x^2)$ $- 8x^2 + 52x - 60$ $+ (+8x^2 + 40x)$ $+ (12x - 60)$ $+ (-12x - 60)$	$x = 5$ $x = 6$ $x = 2$	$(x - 5)(x - 6)(x - 2) = f(x)$
12. $g(x) = x^3 + 6x^2 - 11x - 66$ $x^3 - 1 \cancel{ } x^3 + 6x^2 - 11x - 66$ $+ (x^3 + 6x^2)$ $- 11x - 66$ $+ (-11x - 66)$	$x = -6$ $x = \pm \sqrt{11}$	$(x + 6)(x + \sqrt{11})(x - \sqrt{11}) = g(x)$ or $(x + 6)(x^2 - 11) = g(x)$
13. $p(x) = x^3 + 17x^2 + 92x + 150$ $x + 3 \cancel{ } x^3 + 17x^2 + 92x + 150$ $+ (x^3 + 3x^2)$ $14x^2 + 92x + 150$ $+ (14x^2 + 150)$ $+ (50x + 150)$ $+ (-50x - 150)$	$x = -3$ $x = -7 \pm i$ $x = -14 \pm \frac{\sqrt{196 - 200}}{2} = -14 \pm \frac{\sqrt{-4}}{2} = -14 \pm 2i = -7 \pm i$	$(x + 3)(x^2 + 14x + 50) = p(x)$
14. $q(x) = x^4 - 6x^3 + 3x^2 + 12x - 10$ $x^2 - 2 \cancel{ } x^4 - 6x^3 + 3x^2 + 12x - 10$ $+ (x^4 + 2x^2)$ $- 6x^3 + 5x^2 + 12x - 10$ $+ (16x^3 + 16x)$ $+ 5x^2 - 10$ $+ (-5x^2 + 10)$	$x = \sqrt{2}$ $x = -\sqrt{2}$ $x = 5$ $x = 1$	<del><math>(x - \sqrt{2})(x + \sqrt{2})(x - 3)(x - 1) = q(x)</math></del> would get using quad. formula

H

\* Then

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SECONDARY MATH III // MODULE 3  
POLYNOMIAL FUNCTIONS - 3.8

**GO**

Topic: Finding the inverse function

Find the inverse of each function below

15.  $f(x) = 3x - 1$   $\downarrow \begin{smallmatrix} 3 \\ -1 \end{smallmatrix}$   $\uparrow \begin{smallmatrix} \div 3 \\ +1 \end{smallmatrix}$

$$f^{-1}(x) = \frac{x+1}{3}$$

16.  $f(x) = -\frac{1}{x} - 1$   $\downarrow \begin{smallmatrix} \wedge -1 \\ -1 \end{smallmatrix}$   $\uparrow \begin{smallmatrix} \wedge -1 \\ +1 \end{smallmatrix}$  7

$$f^{-1}(x) = \frac{1}{x+1} = \frac{-1}{x+1}$$

17.  $f(x) = -\frac{1}{x} - 1 \rightarrow$

\*18.  $f(x) = 2x^2 - 1; x \geq 0$   $\downarrow \begin{smallmatrix} \wedge 2 \\ -1 \end{smallmatrix}$   $\uparrow \begin{smallmatrix} \div 2 \\ +1 \end{smallmatrix}$

$$f^{-1}(x) = \sqrt{\frac{x+1}{2}} : \text{(Restriction not needed for domain or range)}$$

19.  $f(x) = \frac{4}{5}x - 4$   $\downarrow \begin{smallmatrix} \cdot \frac{5}{4} \\ -4 \end{smallmatrix}$   $\uparrow \begin{smallmatrix} \div \frac{4}{5} \\ +4 \end{smallmatrix}$

$$f^{-1}(x) = \frac{5}{4}(x+4)$$

20.  $f(x) = x^3 + 3$   $\downarrow \begin{smallmatrix} \wedge 3 \\ +3 \end{smallmatrix}$   $\uparrow \begin{smallmatrix} \div 3 \\ -3 \end{smallmatrix}$

$$f^{-1}(x) = \sqrt[3]{x-3}$$

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