Algebra 2

Chapter 5 Final Exam Review

5-27. Write the inverse equation for each of the following equations.

a. $y = 3x - 8$

$\frac{x+8}{3} = y$

b. $y = \frac{1}{2}x + 6$

$2(x-6) = y$

c. $y = \frac{x+6}{2}$

$2x+16$

5-51. Find the inverse of each of the following functions by first switching *x* and *y* and then solving for *y*.

a. $y = x^2 + 3$

$\sqrt{x-3}$

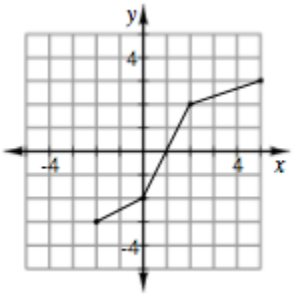
b. $y = \left(\frac{1}{4}x + 6\right)^3$

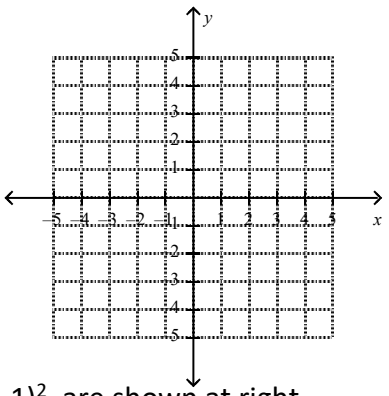
$x = \frac{1}{4}y + 6 \quad 3\sqrt{4x-6}$

c. $y = \sqrt{5x-6}$

$\frac{y^2+6}{5}$

5-33. The function $f(x)$ is represented in the graph at right. Draw a graph of its inverse function. Be sure to state the domain and range for both $f(x)$ and $f^{-1}(x)$.

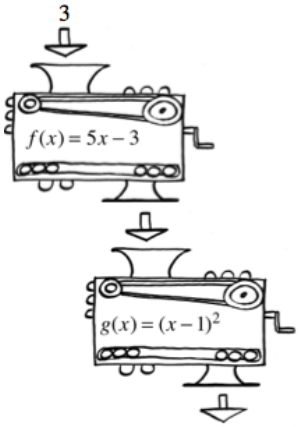




5-48. Two function machines, $f(x) = 5x - 3$ and $g(x) = (x - 1)^2$, are shown at right.

a. Suppose $f(3)$, (not $x = 3$), is dropped into the $g(x)$ machine. This is written as $g(f(3))$. What is this output?

b. Using the same function machines, what is $f(g(3))$? Be careful! The result is different from the last one because the order in which you use the machines has been switched! With $f(g(3))$, first you find $g(3)$, then you substitute that answer into the machine named $f(x)$.



5. cos

6.) Tan

7) $\sin^2$

8) $\cos^2$

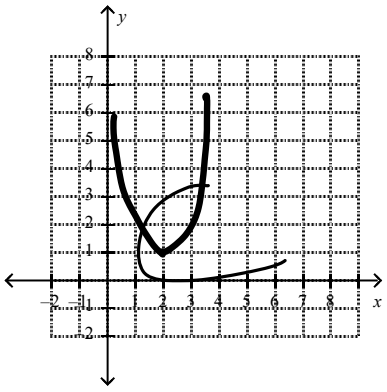
9) csc

10) sec

CL 5-127. Given the function : $f(x) = 2 + \sqrt{x-1}$

a. Graph $f(x)$ and state the domain and range.

$(x-2)^2+1$



b. Determine the equation for $f^{-1}(x)$, that is, the inverse of $f(x)$.

c. Graph $f^{-1}(x)$ using the appropriate new domain and range.

d. Compute $f^{-1}(f(5))$ and $f(f^{-1}(5))$ to show that your answer is correct.

5-74. Every exponential equation has an equivalent logarithmic form and every logarithmic equation has an equivalent exponential form. For example,

exponent ↓

$4^3 = 64$ is equivalent to $3 = \log_4 64$

↑ base ↑ exponent ↑ base

Copy the table shown below and fill in the missing form in each row.

	Exponential Form	Logarithmic Form
a.	$y = 5^x$	$x = \log_5$
b.	$7^y = x$	$y = \log_7(x)$
c.	$8^x = y$	
d.	$A^K = C$	
e.		$K = \log_A(C)$
f.		$\log_{1/2}(K) = N$

5-97. Copy these equations and solve for x. You should be able to do all these problems without a calculator.

a. $\log_x(25) = 1$

$x^1 = 25$

25

b. $x = \log_3(9)$

$3^x = 9$

$x = 2$

c. $3 = \log_7(x)$

$7^3 = x$

343

d. $\log_3(x) = \frac{1}{2}$

$3^{\frac{1}{2}} = 1.73$

e. $3 = \log_x(27)$

$x^3 = 27$

$x = 3$

f. $\log_{10}(10000) = x$

$10^x = 10000$

$x = 4$

5-49. This problem is a checkpoint for multiplying polynomials. It will be referred to as Checkpoint 5A. Multiply and simplify each expression below.

a. $(x + 1)(2x^2 - 3)$ b. $(x + 1)(x^2 - 2x + 3)$ c. $2(x + 3)^2$

5-66. Factor each expression completely.

a. $x^2 - 49$ b. $6x^2 + 48x$ c. $x^2 - x - 72$

$(x+7)(x-7)$ $6x(x+8)$ $(x+8)(x-9)$

6-141. If $f(x) = x^4$ and $g(x) = 3(x + 2)$, find the value of each expression below.

a. $f(2)$ b. $g(2)$ c. $f(g(2))$ d. $g(f(2))$

e. Are $f(x)$ and $g(x)$ inverses of each other? Justify your answer.

5.G *Transforming the family logarithmic functions.*

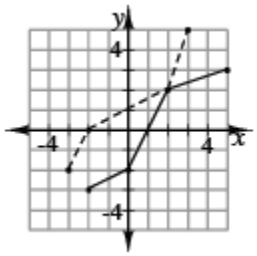
Given the equation $g(x) = \log_2(x-3) + 5$, how does this transform the graph of $f(x) = \log_2 x$?

Chapter 5 Final Exam Review – Answers

5-27. a. $y = \dfrac{(x+8)}{3}$ b. $y = 2(x-6)$ $y = 2x-6$

5-51. a. $y = \pm\sqrt{x-3}$ b. $y = 4\left(\sqrt[3]{x}-6\right)$ c. $y = \frac{x^2+6}{5}$

5-33.



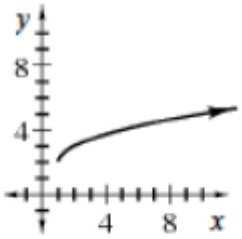
5-48.

a. 121

b. 17

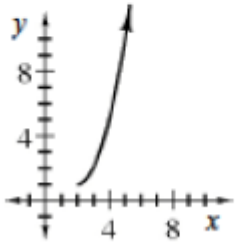
CL 5-127

a. domain $x \geq 1$; range $y \geq 2$



b. $f^{-1}(x) = (x-2)^2 + 1$

c. domain $x \geq 2$; range $y \geq 1$



d. $f^{-1}(f(5)) = f(f^{-1}(5)) = 5$

6-141. See below:

a. 16 b.12 c. $12^4 = 20736$ d.54

e. No, they are not inverses (if they were, then the answers to parts (c) and (d) would have to be 2).

5-74. See below:

- $x = \log_5(y)$
- $x = 7^y$
- $x = \log_8(y)$
- $K = \log_A(C)$
- $C = A^K$
- $K = \left(\frac{1}{2}\right)^N$

5-97. See below:

1. $x = 25$
2. $x = 2$
3. $x = 343$
4. $x = \sqrt{3}$
5. $x = 3$
6. $x = 4$

5-49. See below:

1. $2x^3 + 2x^2 - 3x - 3$
2. $x^3 - x^2 + x + 3$
3. $2x^2 + 12x + 18$

5-66. See below:

1. $(x + 7)(x - 7)$
2. $6x(x + 8)$
3. $(x - 9)(x + 8)$

5G. Shifts the graph of $f(x)$ right three and up 5.