

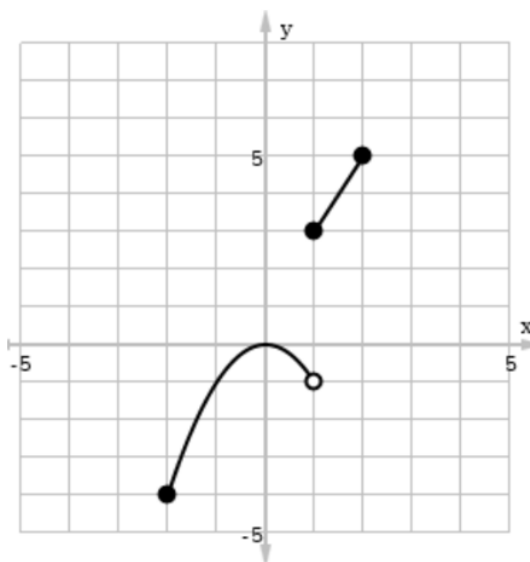
Mat 110 Quiz 1 Review

Name: _____

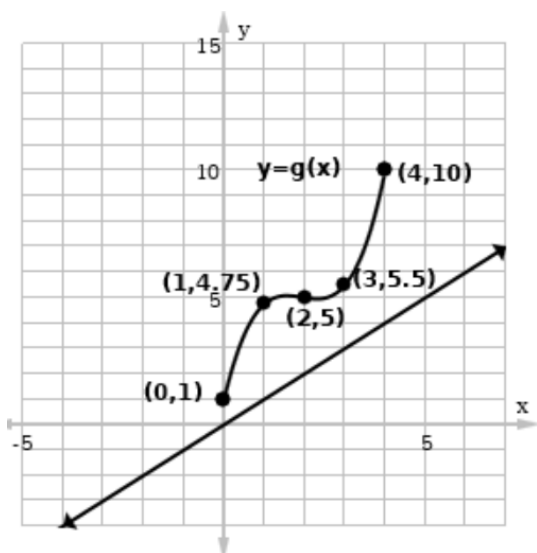
Show all your work to ensure full credit.

1. Use the graph of the function $y = f(x)$ shown to the right fill in the blanks below.
 - a. $f(2) =$ _____
 - b. $f(\text{_____}) = -3$
 - c. Domain of $f =$ _____
 - d. Range of $f =$ _____
 - e. Is $f(x)$ a one-to-one function?

 Yes NO



2. Given the one-to-one $y = g(x)$ function below,
 - a. Sketch the graph of the inverse function on the same coordinate axes of $y = g(x)$.



- b. Find the following

Domain of $g(x) =$ _____

Range of $g(x) =$ _____

Domain of $g^{-1}(x) =$ _____

Range of $g^{-1}(x) =$ _____
- c. Use the graph to determine the value of

 $g^{-1}(5) =$ _____

3. The radioactive substance has a half-life of 38 hours. The amount $A(t)$ of the sample remaining (in grams) after t hours is given by the following exponential function.

$A(t) = 340 \left(\frac{1}{2}\right)^{\frac{t}{38}}$ Find the initial amount in the sample and the amount remaining after 60 hours. Round your answer to the nearest gram as necessary.

4. Find the difference quotient $\frac{f(x+h)-f(x)}{h}$ where $h \neq 0$ for the function below. Explain what this quotient represents. Simplify your answer as much as possible.

$$f(x) = 3x^2 - 2$$

<p>5. Evaluate each logarithmic function below.</p> <p>a. $\log_2 16 =$</p> <p>b. $\log_5 25 =$</p> <p>c. $\log_2 \frac{1}{8} =$</p> <p>d. $\log_3 \sqrt{3} =$</p> <p>e. $\log_6 1 =$</p> <p>f. $\log_9 3 =$</p> <p>g. $\log_{10} 0.00001 =$</p>	<p>6. The tables below give exponential or logarithmic functions in the form $y = a^x$ or $y = \log_a x$. Write the equation for each of the functions.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$f(x)$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">x</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$g(x)$</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">-2</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$\frac{1}{4}$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$\frac{1}{e^2}$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">-2</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">-1</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$\frac{1}{2}$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">$\frac{1}{e}$</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">-1</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">0</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">0</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">e</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">1</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">2</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">4</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">e^2</td> <td style="border: 1px solid black; padding: 5px; text-align: center;">2</td> </tr> </table> <p>$f(x) =$ _____ $g(x) =$ _____</p>	x	$f(x)$	x	$g(x)$	-2	$\frac{1}{4}$	$\frac{1}{e^2}$	-2	-1	$\frac{1}{2}$	$\frac{1}{e}$	-1	0	1	1	0	1	2	e	1	2	4	e^2	2
x	$f(x)$	x	$g(x)$																						
-2	$\frac{1}{4}$	$\frac{1}{e^2}$	-2																						
-1	$\frac{1}{2}$	$\frac{1}{e}$	-1																						
0	1	1	0																						
1	2	e	1																						
2	4	e^2	2																						

7. Find the inverses of the following one-to-one functions. Then find the domains and ranges of the functions and their inverses.

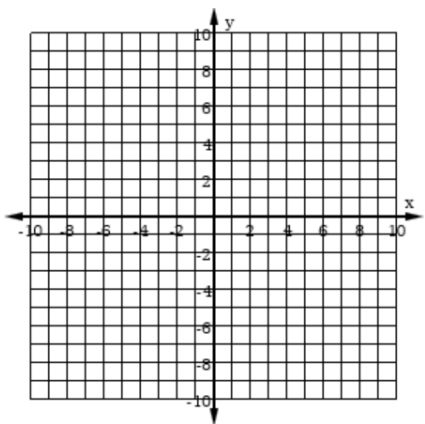
a. $g(x) = 2^x$

b. $f(x) = \sqrt{2-x}$, for $x \leq 2$

c. $y = \frac{3x-5}{2x+1}$

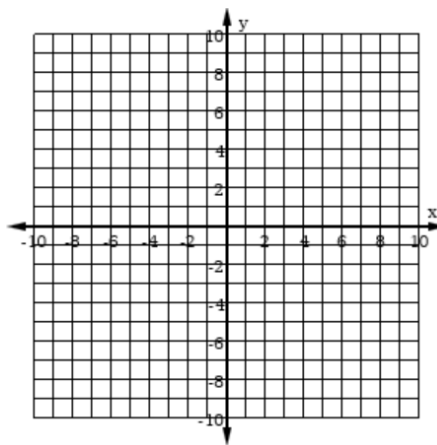
8. Sketch the graph of the functions and relations below. Explain clearly how you decided the graph was the shape you drew. Can you determine the domain and range of the functions and relations that you graphed based on the graphs.

a. $y = 2^x$



x	y

b. $y = \log_2(x)$



x	y