Math 1220 Test 3 Review

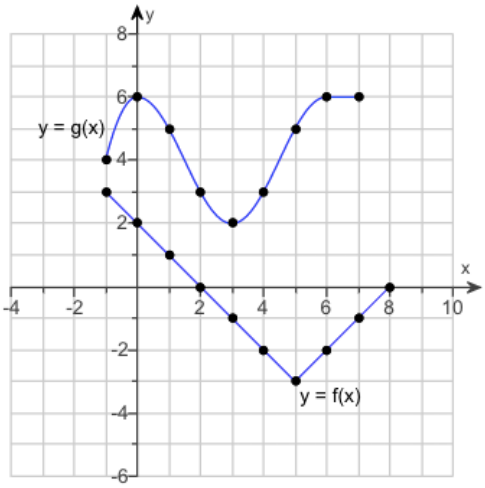
Composition

1. For each pair below, find the composite function $(f \circ g)(x)$. Then give the domain of the composite function.

   a) $f(x) = 1 - 2x, \quad g(x) = \sqrt{x-2}$

   b) $f(x) = 2x^2 + 7, \quad g(x) = \sqrt{x-3}$

   c) $f(x) = \dfrac{x-5}{x+1}, \quad g(x) = \dfrac{1}{x}$



2. Given the graphs of f and g find $(f \circ g)(4)$

3. For $f(x) = 2^x, \quad g(x) = 3x - 2$ find $(f \circ g)(2)$

Inverses

4. Find the inverses of each function. State the domain the the range of both f and f^{-1}.

$f(x) = \dfrac{x+2}{x-3}$ $\qquad$ $f(x) = \sqrt{x+1} + 2$ $\qquad$ $f(x) = \log_3(x-1) + 2$ $\qquad$ $f(x) = e^{2x-3}$

f D: _____ R: _____ **f⁻¹** D: _____ R: _____	**f** D: _____ R: _____ **f⁻¹** D: _____ R: _____	**f** D: _____ R: _____ **f⁻¹** D: _____ R: _____	**f** D: _____ R: _____ **f⁻¹** D: _____ R: _____

Exponentials and Logs

5. Given $f(x)=3^x$, $g(x)=\log_3 x$, evaluate

$f(4)$ $\qquad$ $g(9)=\sqrt{x+1}+2$ $\qquad$ $f(-2)$ $\qquad$ $g\left(\frac{1}{27}\right)$

6. Evaluate each expression without using a calculator.

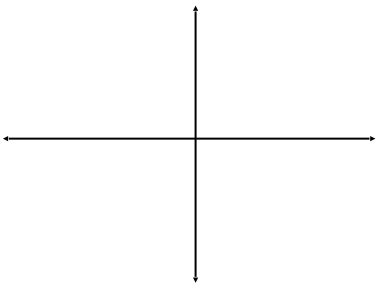
$\log_2\left(\frac{1}{8}\right)$ $\qquad$ $\ln e^{\sqrt{2}}$ $\qquad$ $2^{\log_2(0.4)}$

7. What is the domain of $f(x)=7\ln(2x-5)+3$?

Graphing

8. Graph each of the following functions. Give the domain and range and any asymptote

$f(x)=1-\log_5(x-2)$



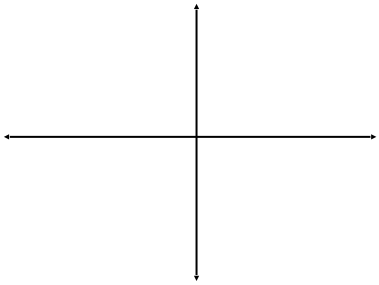
D: _____

x-int(s): _____

y-int(s): _____

asy(s): _____

$f(x)=4^{x+1}-2$



D: _____

x-int(s): _____

y-int(s): _____

asy(s): _____

Solving Equations

9. Solve.

$8^{6+3x}=4$ $\qquad$ $\log_x 64=-3$ $\qquad$ $5^x=3^{x+2}$

10. Solve

$\log_3 \sqrt{x-2} = 2$ $\log_6(x+3) + \log_6(x+4) = 1$ $e^{1-x} = 5$

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$8 - 2e^{-x} = 4$ $\log(x^2+3) = \log(x+6)$ $9^x + 4 \bullet 3^x - 3 = 0$