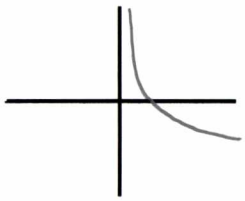
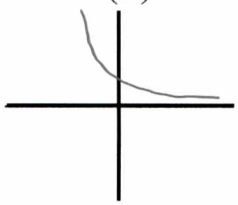
Sketch the general shape and position of each of the graphs below. **(You do NOT need to label points.)** **SCORE: ____ / 4 PTS**

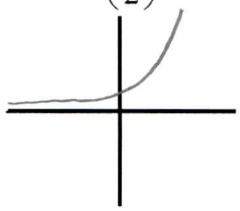
$f(x) = \log_{0.4} x$



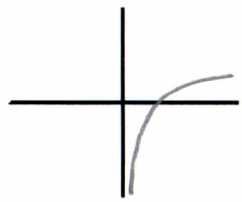
$f(x) = \left(\frac{3}{5}\right)^x$



$f(x) = \left(\frac{7}{2}\right)^x$



$f(x) = \log_4 x$



Rewrite the following equations in the specified form. **SCORE: ____ / 2 PTS**

$\log_y 2z = 5$ in exponential form: $y^5 = 2z$

$m^{4t} = x + 2$ in logarithmic form: $\log_m (x+2) = 4t$

Write expressions for the following problems. **You do NOT need to simplify your answer to a single number.** **SCORE: ____ / 2 PTS**

[a] You borrow $\$25{,}000$ for 7 years compounded monthly at an annual rate of 4.3%. How much do you owe at the end ?

$$25000\left(1 + \frac{0.043}{12}\right)^{84}$$

[b] You lend your friend $\$4{,}100$ for 3 years compounded continuously at an annual rate of 2.1%. How much does your friend owe you at the end ?

$$4100\, e^{0.021 * 3}$$

Find the equation of the vertical asymptote of the graph of $f(x) = 5\ln(1 - 3x) + 2$. **SCORE: ____ / 1 PTS**

$$1 - 3x = 0$$

$$x = \frac{1}{3}$$

Evaluate the following logarithmic expressions. If a value is undefined/does not exist, write **DNE**. **SCORE: ____ / 5 PTS**

$\log 10^{-6} =$ -6 $\log_{13} 1 =$ 0 $\log_3 \frac{1}{9} =$ -2

$e^{\ln 0} =$ DNE $\log_4 64 =$ 3

Use the One-to-One Property to solve $27^{x+3} = 9^{2x+7}$. **SCORE: ____ / 2 PTS**

$$(3^3)^{x+3} = (3^2)^{2x+7}$$

$$3^{3x+9} = 3^{4x+14}$$

$$3x+9 = 4x+14$$

$$x = -5$$

Use transformations to graph $f(x) = -\log_2(x-3) - 4$. **SCORE: ____ / 4 PTS**

You must show the result of transforming each significant point and feature as shown in lecture.

REFLECT OVER X-AXIS
SHIFT RIGHT BY 3
DOWN BY 4

$(1,0) \longrightarrow$	$(1,0) \longrightarrow$	$(4,0) \longrightarrow$	$(4,-4)$
$(2,1)$	$(2,-1)$	$(5,-1)$	$(5,-5)$
$x=0$	$x=0$	$x=3$	$x=3$