Name: _____ Date: _____

5-2 Exponential Function Basics
Math III Homework

Fluency

1. Which of the following represents an exponential function?

   (1) $y = 3x - 7$ (3) $y = 3(7)^x$

   (2) $y = 7x^3$ (4) $y = 3x^2 + 7$ _____

2. If $f(x) = 6(9)^x$ then $f\left(\frac{1}{2}\right) = ?$ (Remember what we just learned about fractional exponents and do withou a calculator.)

   (1) $\frac{7}{2}$ (3) 27

   (2) 18 (4) $\frac{15}{2}$ _____

3. If $h(x) = 3^x$ and $g(x) = 5x - 7$ then $h(g(2)) =$

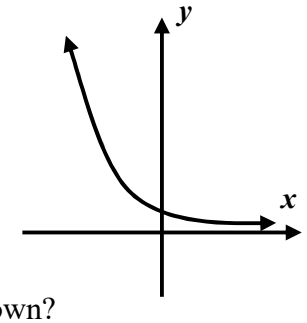
   (1) 18 (3) 38

   (2) 12 (4) 27 _____

4. Which of the following equations could describe the graph shown below?

   (1) $y = x^2 + 1$ (3) $y = -2x + 1$

   (2) $y = \left(\frac{2}{3}\right)^x$ (4) $y = 4^x$



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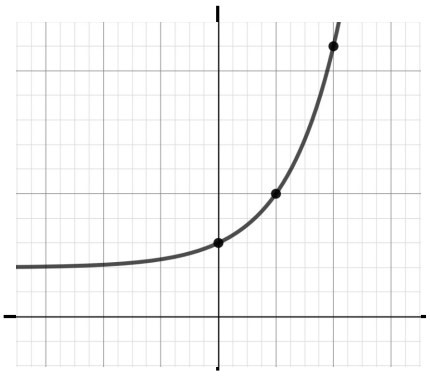
5. Which of the following equations represents the graph shown?

   (1) $y = 5^x$ (3) $y = \left(\frac{1}{2}\right)^x + 2$

   (2) $y = 4^x + 1$ (4) $y = 3^x + 2$



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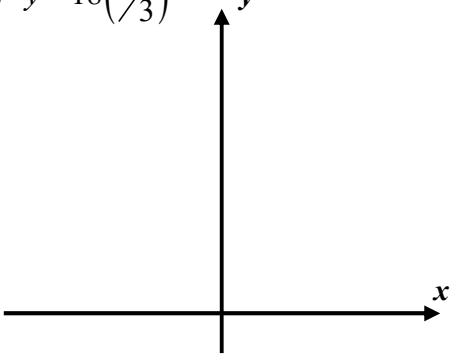
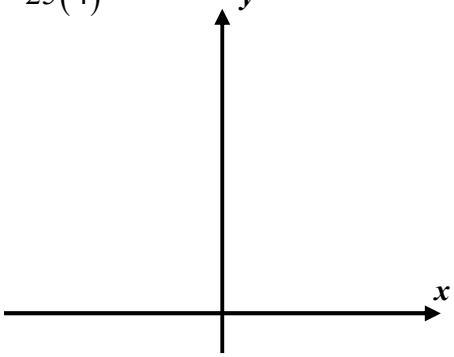
6. Sketch graphs of the equations shown below on the axes given. Label the *y*-intercepts of each graph.

(a) $y = 18\left(\frac{1}{3}\right)^x$



(b) $y = 25(4)^x$



APPLICATION

7. The Fahrenheit temperature of a cup of coffee, *F*, starts at a temperature of $185\,^{\circ}\text{F}$. It cools down according to the exponential function $F(m) = 113\left(\frac{1}{2}\right)^{m/20} + 72$, where *m* is the number minutes it has been cooling.

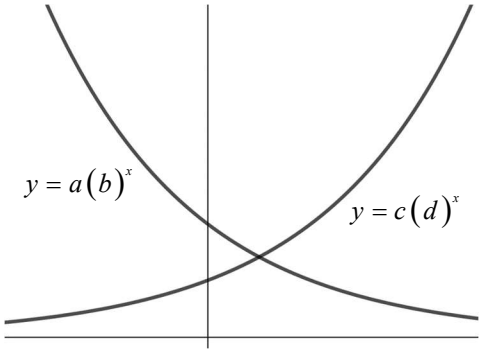
(a) How do you interpret the statement that $F(60) = 86$?

(b) Determine the temperature of the coffee after one day using your calculator. What do you think this temperature represents about the physical situation?

REASONING

8. The graph below shows two exponential functions, with real number constants *a*, *b*, *c*, and *d*. Given the graphs, only one pair of the constants shown below could be equal in value. Determine which pair could be equal and explain your reasoning.

b and *d* *a* and *b* *a* and *c*



9. Explain why the equation below can have no real solutions. If you need to, graph both sides of the equation using your calculator to visualize the reason.

$$3^x + 5 = 2$$