

### Practice Test #1

#1 (a) Find the slope of the line passing through the two given points. Also state whether the line is increasing, decreasing, horizontal, or vertical.

$$(1, 8) \text{ and } (5, 4).$$

(b) While taking off, airplane A steadily climbs 2500 feet over a horizontal distance of 8000 feet. Airplane B steadily climbs 3100 feet over a horizontal distance of 9500 feet. Which plane is climbing more steeply? Explain.

#2 Find an equation of the line that has the given slope and contains the given point. Find the intercepts of this line.

$$\frac{3}{4}, (-5, 2).$$

#3 Use elimination or substitution to solve the following system:

$$2x - 6y = 2$$

$$4x + 9y = 25$$

#4 Simplify the following expression. Assume that b and c are positive.

$$[(8b^3)^2(b^2c^8)]^{\frac{1}{4}}$$

#5 Solve the following equation

$$2.1b^5 - 8.2 = 0$$

#6 Find an equation for the exponential curve that passes through the given pair of points.

$$(10, 7) \text{ and } (15, 105).$$

#7 A storage tank contains radium, a radioactive element with a half life of 1600 years. Let  $f(t)$  represent the percentage of radium that will remain in the tank at  $t$  years since the element was placed in the tank.

(a) Find an equation for  $f(t)$ .

(b) What percentage of the radium will remain in the tank after 100 years?

(c) What percentage of the radium will remain in the tank after 3200 years?

Explain how you can find this result without using the equation for  $f$ .

#8 Find the logarithm:

$$\log_2(\log_3(81))$$

#9 (a) Let  $f(x) = 2^x$ . Find  $f^{-1}(16)$ .

(b) Let  $g(x) = \log_3(x)$ . Find  $g^{-1}(2)$ .

(c) Sketch the graph of  $h(x) = 8\left(\frac{1}{2}\right)^x$ .