

## Exam on Math Preliminaries

Name: \_\_\_\_\_

1. Solve the following system of equations.

$$3y - 2x = 11$$

$$y + 2x = 9$$

2. Plot the graph of  $y = 20 - 0.5x$ , and indicate the slope and the intercept of that function.

3.  $\frac{2}{3} + \frac{1}{4} =$

a.  $\frac{3}{7}$

b.  $\frac{2}{12}$

c.  $\frac{11}{12}$

d. 1

4.  $x^a x^b =$

a.  $x^a + x^b$

b.  $x^{ab}$

c.  $x^{a+b}$

d. None of the above

5.  $\frac{x^5}{x^3} =$
- $x^{15}$
  - $x^8$
  - $\frac{1}{x^2}$
  - $x^2$
6.  $(x^a)^b =$
- $x^{a+b}$
  - $x^{ab}$
  - $x^a x^b$
  - None of the above
7.  $\ln(x \cdot y) =$
- $\ln(x) + \ln(y)$
  - $\ln(x^y)$
  - $x \ln(y)$
  - $y \ln(x)$
8.  $\ln(x^a) =$
- $\ln a + \ln x$
  - $a^2 + x^2 + 2ax$
  - $a \cdot \exp(x)$
  - $a \ln(x)$
9.  $\ln\left(\frac{x}{y}\right) =$
- $\ln(y) - \ln(x)$
  - $\ln(x) + \ln(y)$
  - $\ln(x) - \ln(y)$
  - $\frac{1}{y} \ln(x)$
10. Let  $f(x) = x^a$ . Then  $f'(x) =$ ,
- $\frac{x^a}{a}$
  - $ax^{a-1}$
  - $a^x$
  - $x^2$

Where  $\left(f'(x) = \frac{df(x)}{dx}\right)$

11. Let  $f(x) = a \ln(x)$ . Then  $f'(x)$ ,

a.  $\frac{a}{x}$

b.  $ax^{a-1}$

c.  $\frac{x^a}{a}$

d.  $a^x$

12. How much is 25% out of 200?

13. Suppose that the price of a pair of shoes was \$60 in 2004 and the \$75 in 2005.  
What is the percentage increase in the price?