

3. (6 points) Solve for  $x$  in the following equations.  
 (b)  $3(7 + 5x) = 37 - [5(x + 2) - 11x]$
4. (4 points) Simplify the following expressions. Your answers should have no negative exponents.  
 (a)  $(2x^3y^{-3}z^3)^{-2}(5x^{-1}y^2z^3)^2$
11. (2 points) Rationalize the denominator and simplify. (b)  $\frac{\sqrt{2}}{\sqrt{4} - \sqrt{8}}$
15. (3 points) Solve the system by the method of substitution.  

$$\begin{cases} 4x - y = 2 \\ -3x + 2y = 6 \end{cases}$$
16. (3 points) Solve the system by the method of elimination.  

$$\begin{cases} 5x - 2y = 7 \\ 6x + 4y = 2 \end{cases}$$
17. (3 points) Determine whether the following pairs of lines are parallel, perpendicular, or neither.  
 (a)  $\begin{cases} 4x - 2y = -14 \\ 2x + y = 7 \end{cases}$  (b)  $\begin{cases} 2x + 3y = 1 \\ 6x - 4y = 17 \end{cases}$
18. (8 points) Given points  $A(-4, 1), B(2, 3), C(4, 3)$   
 (a) Write an equation for the line that passes through points  $A$  and  $B$ .  
 (b) Write an equation for the line that passes through  $B$  and is perpendicular to the line  $x = -7$ .  
 (c) Determine the distance between points  $A$  and  $B$ .  
 (d) Find the midpoint of the line segment connecting the points  $A$  and  $C$ .

### 016 Final Exam – Winter 2014

7. [2] A textbook is on sale for \$63 after a discount of 16%. Find the original price of the textbook. (  $SP = OP - DR \cdot OP$  )
8. [2] How long will it take for a principal of \$3500 to earn \$420 in interest if the annual simple interest rate is 4% ? (Recall:  $I = Prt$  )

### 201-016 Algebra & Functions Final Exam - May 2015

3. [6] Solve for  $x$ .  
 (b)  $\frac{2}{3}x + 2 = \frac{1}{2}\left(\frac{5}{3} - \frac{x}{2}\right)$   
 (c)  $\frac{4}{3} = \frac{3}{x+2}$
4. [4] Simplify. Your answers should have no negative exponents.  
 (a)  $\left(\frac{15a^{-1}b^3}{9a^{-2}b^{-2}}\right)^{-2}$   
 (b)  $(-2x^2y^{-3})^2(3x^{-1}y)$
7. [3] My local pet food store marks up its products by 25%. If I paid \$65 for a bag of dog food, what is the store's cost?
8. [2] My initial investment of \$5000 earned an interest of \$600 after 4 years. What was the interest rate? (Recall:  $I = Prt$  )
15. [3] Solve the system by *substitution*.  

$$\begin{cases} 5x + 6y = 1 \\ 2x + 3y = 1 \end{cases}$$
16. [3] Solve the system by *elimination*.  

$$\begin{cases} 3x + 4y = -8 \\ -6x - 7y = 14 \end{cases}$$
17. [3] For the points  $A(1, -11)$  and  $B(5, -17)$ :  
 (a) Find the distance between  $A$  and  $B$ .  
 (b) Find the midpoint of the line segment joining  $A$  and  $B$ .
18. [5]  
 (a) Find an equation for the line that passes through  $(-3, -1)$  and  $(2, -4)$ .  
 (b) What is the slope of this line?  
 (c) What is the y-intercept of this line?  
 (d) What is the x-intercept of this line?
19. [4]  
 (a) Sketch the lines  $y = -2x + 4$  and  $y = \frac{1}{2}x + 3$   
 (b) Find the point of intersection of the two lines.  
 (c) Determine whether the lines are parallel, perpendicular, or neither. Explain your answer.