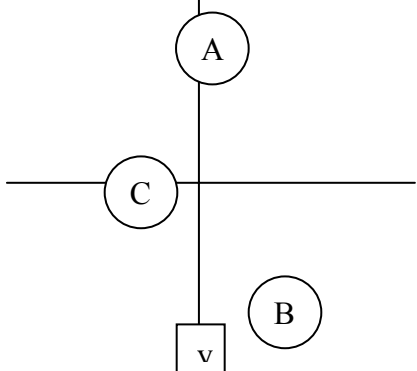
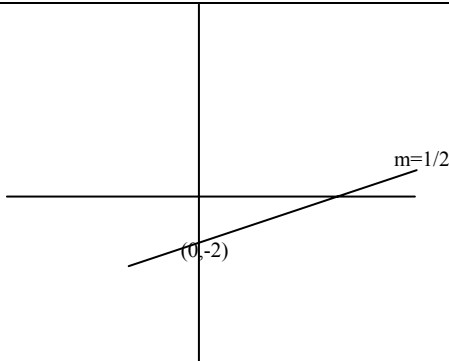
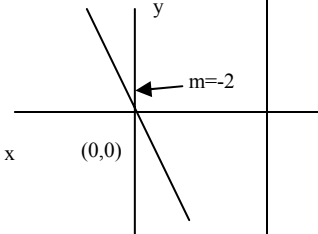


Homework Problems
Lecture 2 -- Answer Key

<p>1. If $a + 2 > 5$ and $a - 4 < 1$, what is a possible value for a?</p>	<p>Inequalities are very similar to equations. The only difference between them is that if you multiply or divide both sides of an inequality by a negative number, you must reverse the sign. Here you have two inequalities, which you can solve the same way you would solve an equation. In the first inequality, you can subtract 2 from both sides:</p> $\begin{array}{r} a + 2 > 5 \\ -2 \quad -2 \\ \hline a > 3 \end{array}$ <p>The second inequality is similar. It can be solved by adding 4 to both sides:</p> $a - 4 + 4 < 1 + 4 \rightarrow a < 5$ <p>a can be any number between 3 and 5.</p>
<p>2. Draw a Cartesian coordinate system, labeling the axes. Place the following points on the graph.</p> <p>A (0,5) B(4,-6) C(-2,0)</p>	
<p>3. If $\sqrt{x + 8} = 5$, what is the value of x?</p>	$\sqrt{x + 8} = 5$ $x + 8 = 25 \rightarrow x = 25 - 8 = 17$ <p>When you solve for a variable, make the equation easier to work with by removing any fractions or square roots. Then you just need to isolate the variable on one side of the equation.</p>
<p>4. If 50 percent of 40 percent of a number is 22.8, what is the number?</p>	$(0.50)(0.40)x = 22.8$ $0.20x = 22.8$

	$x = \frac{22.8}{0.20} = 114$
5. If $a^5 - 25 = a^5 - b$, then $b =$	Solve for b by first subtracting a^5 from both sides. Then you have $-25 = -b$, or $b = 25$.
6. Jo spends 25 percent of her monthly income on food, 30 percent on rent, 20 percent on insurance, and 10 percent on entertainment and miscellaneous expenses. Of her remaining income, she gives half to charity and saves the rest. If Jo saves 75 dollars every month, what is her total monthly income?	$0.25I + 0.3I + 0.1I + 0.2I + 2(75) = I$ $0.85I + 150 = I$ $150 = 0.15I$ $1000 = I$
7. Graph the following equation. $y + 2 = \frac{1}{2}x$	 <p>When $y = 0$, $x = 4$</p>
8. If $c \neq 3$ and $\frac{2c-5}{c-3} = 4$, what is the value of c ?	$(2c - 5) = 4(c - 3)$ $2c - 5 = 4c - 12$ $-5 = 2c - 12$ $7 = 2c$ $c = 7/2 \text{ or } 3.5$
9. In a certain building, there are 10 floors and the number of rooms on each floor is R . If each room has exactly C chairs, which of the following gives the total number of chairs in the building? a. $10R + C$ b. $10R \cdot 10C$ c. $10 / (RC)$ d. $10RC$ e. $100RC$	<p>number of chairs on one floor = (number of rooms on one floor)(number of chairs in room) = RC</p> <p>number of chairs on all floors = (number of floors)(number of chairs on one floor) = $10RC$</p> <p>(D) is the correct choice</p>

<p>10. Picture a graph comparing rate of industrialization and pollution levels. Would you expect the slope to be positive or negative? Explain.</p>	<p>Positive, because as industrialization goes up, so does the rate of pollution</p>
<p>11. If, $\frac{x+y}{x-y} = 7$ what is the value of $\frac{x}{y}$?</p>	<p>This one seems confusing, since you're given the value of $x+y$ over $x-y$ and asked to find $\frac{x}{y}$. The way to do it is just to solve the algebraic equation like you normally would, but to solve it for $\frac{x}{y}$ rather than for x or for y. Since you're given the value of a fraction, first multiply both sides of the equation by $x-y$ to get rid of the denominator. That gives you $x+y=7(x-y)$.</p> $x + y = 7x - 7y$ $8y = 6x$ $\frac{8}{6}y = x$ <p>Since you're looking for $\frac{x}{y}$, divide both sides by y to get: $\frac{8}{6} = \frac{4}{3} = \frac{x}{y}$.</p>
<p>12. If $7\sqrt{x} + 4 = 25$, what is the value of x?</p>	$7\sqrt{x} + 4 = 25$ $7\sqrt{x} = 21$ $\sqrt{x} = 3$ $x = 9$
<p>13. Let's assume y indicates a person's life expectancy and x indicates the distance in miles from a city center, where $y = \frac{x}{5} + 55$</p> <p>a. What is the slope? What does that mean in terms of the relationship between life expectancy and city living?</p> <p>b. What is the y-intercept? What does that mean for life expectancy right in the city?</p>	<p>a. The slope is $1/5$. The further a person lives from the city, the longer s/he will live. If the life expectancy is in years, each mile away from the city raises life expectancy by $1/5$ of a year, or about 10.4 weeks.</p> <p>b. The y intercept is 55. That means that the life expectancy of someone living in the city center is 55.</p>
<p>14. Graph the equation $4x+2y=0$;</p>	<p>First put the equation in y-intercept</p>

<p>label the slope, axes and y intercept.</p>	<p>form.</p> $4x + 2y = 0$ $2y = -4x$ $\frac{2}{2}y = \frac{-4x}{2}$ $y = -2x$ 
<p>15. Solve the two equations below for x and y using substitution.</p> $13x - 5y = -5$ $x + y = 1$	<p>First rearrange one equation so that one variable is expressed in the terms of the other:</p> $x + y - x = 1 - x$ $y = 1 - x$ <p>Next, plug the altered equation into the first equation:</p> $13x - 5y = -5$ $13x - 5(1 - x) = -5$ $13x - 5 + 5x = -5$ $13x + 5x = -5 + 5$ $18x = 0$ $x = \frac{0}{18} = 0, y = 1$
<p>16. Solve the two equations below using the method of your choice.</p> $2x + 3y = 9$ $5x + y = 17$	<p>Substitution:</p> $5x + y = 17$ $y = 17 - 5x$ $2x + 3y = 9$ $2x + 3(17 - 5x) = 9$ $2x + 51 - 15x = 9$ $-13x = -42$ $x = \frac{42}{13}$ $y = 17 - 5\left(\frac{42}{13}\right) = 17 - 16\frac{2}{13} = \frac{11}{13}$ <p>Combination:</p> $-3(5x + y) = 17(-3)$ $-15x - 3y = -51$ $-15x - 3y = -51$ $2x + 3y = 9$ $-----$ $-13x = -42$ <p>Again, $x = \frac{42}{13}, y = \frac{11}{13}$</p>