

Math 105: Intermediate Algebra
SAMPLE EXAM 1: Lessons 1 - 8
Foothill College

Test Information:

1. PLEASE DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO!
2. You are allowed to use a single, HAND-WRITTEN note sheet on this exam no larger than 8.5" x 11". You can write on both sides. Other than this note card, you are not allowed to use notes, books, or classmates as resources for this exam.
3. You may use calculators on this exam. However, show all your work. Be clear about how you achieved your answers.
4. Read the directions carefully. Show all your work for full credit. In most cases, a correct answer with no supporting work will NOT receive full credit. What you write down and how you write it are the most important means of getting a good score on this exam. Neatness and organization are IMPORTANT!
5. Make sure you have 5 pages (10 front and back) including the cover page.
6. You will be graded on your answers AND the work you show. Make sure you show your work and explain your reasoning.
7. Please label the problems you are solving on your scratch paper. Please write these solutions clearly and in an organized manner. If you think you might need scratch extra paper, please see your instructor prior to the start of the exam.

Use for Scratch Work

Definitions: Define each of the following vocabulary words. (5 points each)

1. Algebraic technique for solving algebraic equations

2. Graphical technique for solving algebraic equations

Evaluate each of the following. Show your work. Box your final answer. (5 points each)

3. $-4^2 + 12 \div 3 \cdot 2$

4. $\frac{5}{2} + \frac{3}{2} \cdot \frac{1}{2}$

Factor completely. Show your work. Box your final answer. (5 points each)

5. $2x^4 + x^3 - 3x^2$

6. $4t^2 - 81$

Solve each of the following linear equations. Show your work. Box your final answer. (5 points each)

7. $4b + 9 + 2 = 17 + 6b$

8. $2 \cdot (1 - 3h) - 5 \cdot (2h + 3) = -21$

Using the zero product property, solve each of the following quadratic equations.. Show your work. Box your final answer. (5 points each)

9. $x^2 - 2x - 11 = 1 - x$

10. $8x = x^2$

Solve each of the following absolute value equations. Show your work. Box your final answer. (5 points each)

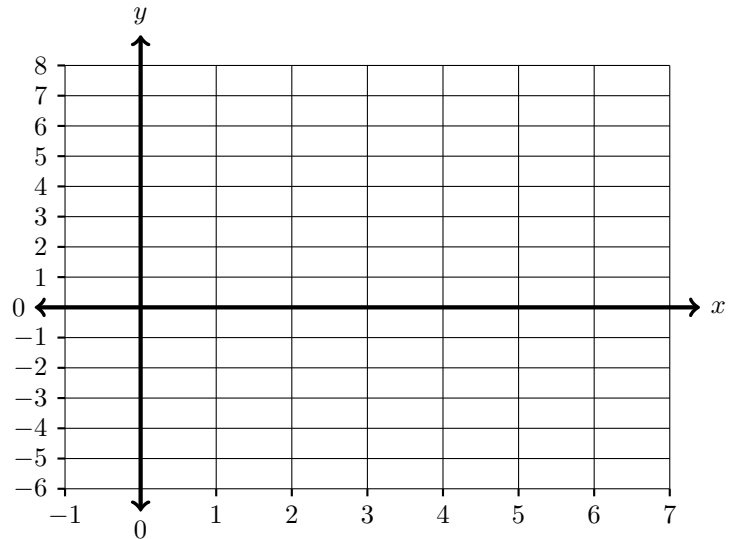
11. $4 - 2|x - 3| = -2$

12. $-2|x - 2| - 2 = 14$

13. (10 points) Solve the absolute value equation below using a graphical technique. Make sure to demonstrate all five steps of this process. Of course, you are welcome to use your calculator. Please specifically identify each point of intersection on your graph. Also, please write each of these points as an ordered pair with an x-coordinate and y-coordinate. Make sure to finish step 5 and use this information to explicitly state the solution(s) to this algebraic equation:

$$4 - 2|x - 3| = -2$$

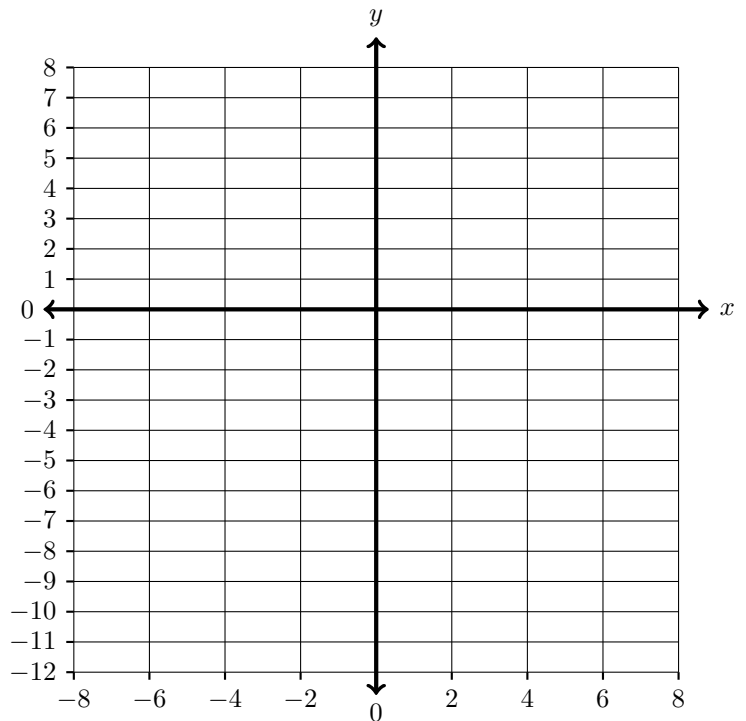
	LHS of Equation	RHS of Equation
x		
-1		
0		
1		
2		
3		
4		
5		
6		
7		



14. (10 points) Solve the quadratic equation below using a graphical technique. Make sure to demonstrate all five steps of this process. Of course, you are welcome to use your calculator. Please specifically identify each point of intersection on your graph. Also, please write each of these points as an ordered pair with an x-coordinate and y-coordinate. Make sure to finish step 5 and use this information to explicitly state the solution(s) to this algebraic equation:

$$x^2 - 2x - 11 = 1 - x$$

	LHS of Equation	RHS of Equation
x		
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		
5		
6		

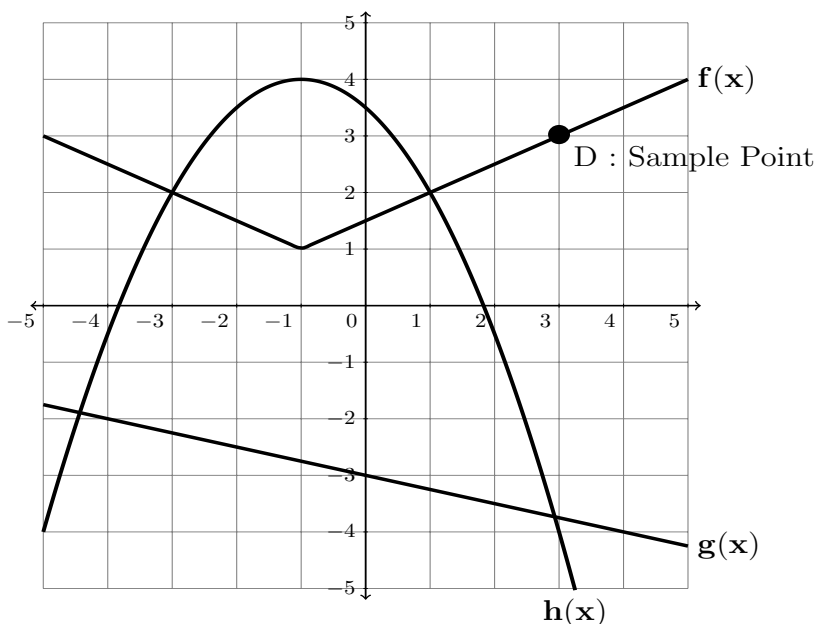


For the questions below, please be as specific as possible in your descriptions. Use full sentences and describe your thoughts in detail. Please be sure to address each item in the question prompt. (5 points each)

15. In your own words, explain the zero product property. Explain how factoring quadratic expressions is related to the zero product property. Then, explain how to use the zero product property as an inverse operation to solve quadratic equations.

16. In your own words, explain the inverse operation for absolute value equations. Then, explain how to use this inverse to solve absolute values equations.

17. (10 points total) Use the following graph to answer the questions below:



A. Match each of the functions in the graph above with its corresponding equation. Write $f(x)$, $g(x)$ or $h(x)$ in the spaces below. (3 points each)

_____ = $3.5 - x - \frac{1}{2}x^2$

_____ = $-3 - \frac{1}{4}x$

_____ = $\left| \frac{x+1}{2} \right| + 1$

B. Find the point(s) on the graph above corresponding to solution(s) of the equation $h(x) = 0$. Put a dot on each point and **label each point with the letter "A"**. (1 points)

C. Using part A above, approximate the x -values for which $h(x) = 0$: (2 points) _____

D. Find the point(s) on the graph at which $g(x) = -4$. Put a dot on each point and **label each point with the letter "B"**. (1 points)

E. For what x -values(s) is $g(x) = -4$? (2 points) _____

F. Find the point(s) on the graph above corresponding to solution(s) of the equation

$$3.5 - x - \frac{1}{2}x^2 = \left| \frac{x+1}{2} \right| + 1$$

Put a dot on each point and **label each point with the letter "C"**. (1 points)

G. (2 points) Using part F, find the x -value(s) for which $3.5 - x - \frac{1}{2}x^2 = \left| \frac{x+1}{2} \right| + 1$: _____

Use for Scratch Work