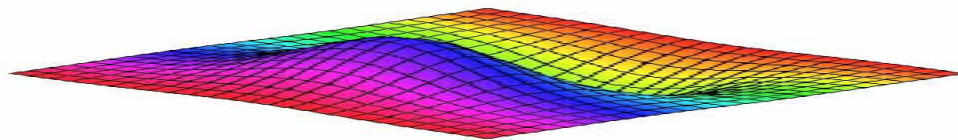


MA 107 INTERMEDIATE ALGEBRA  
-A JUST IN TIME APPROACH-  
PRACTICE TEST TWO

Sections: 3.1, 3.2, 3.3,3.4, 3.5.



In exercise 1-2, solve the system by substitution. [3.1, 3.4]

1.  $5x + y = 4$   
 $2x - 3y = 5$

2.  $x + 2y = -4$   
 $3x - 4y = 4$

Solve the system of equations 3-5, by elimination. [3.1]

3.  $3x - 2y = 8$   
 $2x + 5y = -1$

4.  $2x + 6y = -3$   
 $x + 3y = 2$

5.  $-6x + 10y = -30$   
 $3x - 5y = 15$

In exercise 6, solve the system by any method. Show sketches if you do the problem graphically, or show the algebra if you do the problem symbolically. [3.2]

6.

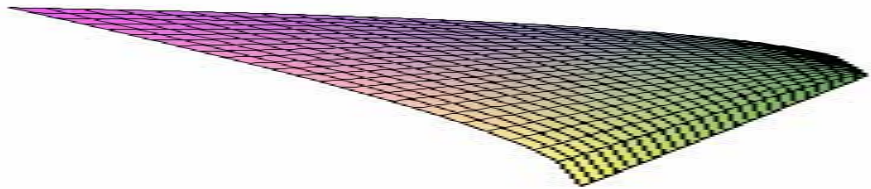
$$2x + y + 2z = 5$$

$$x + 3z = 4$$

$$4x + 3y = 0$$

7. A woman wants to use milk and orange juice to increase the amount of calcium and vitamin A in her daily diet. An ounce of milk contains 37 milligrams of calcium and 57 micrograms of vitamin A. An ounce of orange juice contains 5 milligrams of calcium and 65 micrograms of vitamin A. How many ounces of milk and orange juice should the woman drink each day to provide exactly 500 milligrams of calcium and 1200 micrograms of vitamin A? [3.1, 3.3]

8. **Investment Portfolio** A total of \$25,000 is invested in two funds paying 8% and 8.5% simple interest. If the yearly interest is \$2060, how much of the \$25,000 is invested at each rate? [3.1, 3.3]



9. **Area** What are the dimensions of a rectangular tract of land if its perimeter is 40 miles and its area is 96 square miles? [3.1, 3.3]

10. **Tickets Sales** Five hundred tickets were sold for a certain performance of a play. The tickets for adults and children sold for \$7.50 and \$4.00, respectively, and the total receipts for the performance were \$3312.50. How many of each kind of ticket were sold? [3.1, 3.4]

11. How many pounds of dog food C containing 13% protein and dog food D containing 8% protein need to be blended to obtain 1000 pounds of dog food containing 9% protein? [3.3]

In exercises 12- 13, solve the systems of three equations using either substitution or elimination. [3.4]

$$\begin{aligned} 12. \quad & 2x - 4z = 20 \\ & 5y + 3z = -19 \\ & -2x + 3y = -14 \end{aligned}$$

$$\begin{aligned} 13. \quad & x + 2y - z = -3 \\ & 2x - 4y + z = -7 \\ & -2x + 2y - 3z = 4 \end{aligned}$$

14. **Nutrition** A dietician wishes a patient to have a meal that has 66 grams of protein, 94.5 grams of carbohydrates, and 910 milligrams of calcium. The hospital food service tells the dietician that the dinner for today is chicken, corn, and 2% milk. Each serving of chicken has 30 grams of protein, 35 grams of carbohydrates, and 200 milligrams of calcium. Each serving of corn has 3 grams of protein, 16 grams of carbohydrates, and 10 milligrams of calcium. Each glass of 2% milk has 9 grams of protein, 13 grams of carbohydrates, and 300 milligrams of calcium. How many servings of each food should the dietician provide for the patient? [3.3, 3.4]

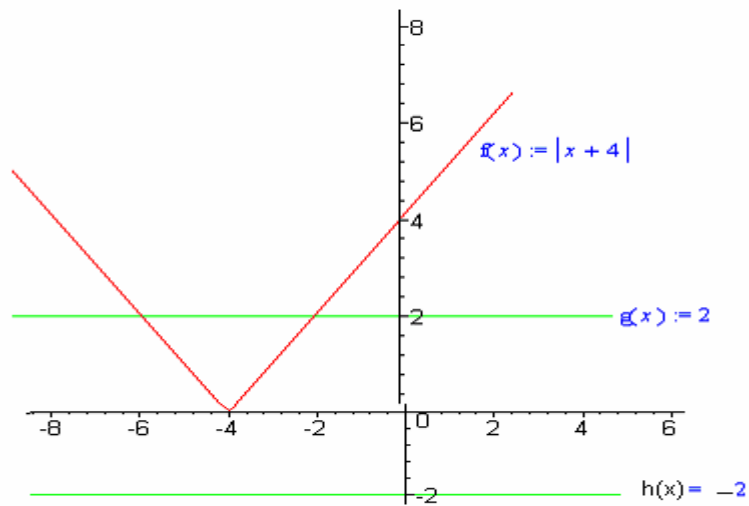
15. Solve for x only: [3.1, 3.4]

$$adx + bdy = de$$

$$bcx + bdy = bf$$

16. **Curve Fitting** Find real numbers a, b, and c so that the graph of the quadratic function  $y = ax^2 + bx + c$  contains the points (-1, -4), (1, 6), and (3, 0). [3.4]

17. Solve these absolute value equations and inequalities from the graph shown in the figure. [3.5]



a)  $|x + 4| < 2$

b)  $|x + 4| \geq 2$

c)  $|x + 4| > -2$

d)  $|x + 4| < -2$

18-20. Solve the inequalities using algebraic notations. [3.5]

18.  $4 - 3(1 - x) \leq 3$

19.  $0.5(x - 4) > x + 8$

20.  $\frac{x}{2} \geq 1 - \frac{x}{4}$

Answers:

1. (1, -1)
2. (-0.8, -1.6)
3. (2, -1)
4. No solution
5. Infinitely many solution
6. Contradiction, inconsistent
- 7) 12.5 ounces of milk, 7.5 ounces of orange juice
  
8. \$13,000 at 8%, \$12,000 at 8.5%
  
9. 8mi by 12 mi
  
10. 375 adults, 125 children
  
11. 200 lbs, 800 lbs
12. (4, -2, -3)
13. (-3,  $\frac{1}{2}$ , 1) 14) 1.5 chicken, 1 corn, 2 milks
  
15.  $x = \frac{de - bf}{ad - bc}$
  
16.  $y = -2x^2 + 5x + 3$ ;  $a = -2$ ,  $b = 5$ ,  $c = 3$
  
- 17 a)  $-6 < x < -2$   
b)  $x \leq -6$  or  $x \geq -2$   
c) All Real Numbers  
d) No solution
  
18.  $\left\{x \mid x \leq \frac{2}{3}\right\}$  or  $(-\infty, \frac{2}{3}]$ ; 19.  $\{x \mid x < -20\}$  or  $(-\infty, -20)$ ; 20)  $\left\{x \mid x \geq \frac{4}{3}\right\}$  or  $\left[\frac{4}{3}, \infty\right)$