

**Los Angeles Southwest College**

**Mathematics Department**

**Math 115 – Common Final Exam**

**Study Guide**

**SPRING 2010**

Prepared by: Instr. B.Nash  
Dr. L.Saakian

## Chapter 1.

1. Simplify:  $8 + [-2 + (-1)]$
2. Simplify:  $-8 + [9 + (-2)]$
3. Simplify:  $[(-9) + (-3)] + 12$
4. Simplify:  $[-5 + (-9)] + [16 + (-21)]$
5. Decide whether the statement is true or false:  $-6 \leq -(-3)$
6. Decide whether the statement is true or false:  $-|8| > |-9|$
7. Decide whether the statement is true or false:  $-4 \leq -(-5)$
8. Decide whether the statement is true or false:  $|13 - 8| \leq |7 - 4|$
9. Perform indicated operation:  $\frac{5(-2) - 3(4)}{-2[3 - (-2)] - 1}$
10. Perform indicated operation:  $\frac{10^2 - 5^2}{8^2 + 3^2 - (-2)}$
11. Perform indicated operation:  $\frac{(0.6)^2 + (0.8)^2}{(-1.2)^2 - (-0.56)}$
12. For the following word phrase write an expression using  $x$  as the variable and simplify. "12 less than the difference between 8 and -5".
13. For the following word phrase write an expression using  $x$  as the variable and simplify. "The sum of -4 and -10, increased by 12".
14. For the following word phrase write an expression using  $x$  as the variable and simplify. "19 less than the difference between 9 and -2".
15. For the following word phrase write an expression using  $x$  as the variable and simplify. "The sum of 12 and -7, decreased by 14".
16. Otis neglects to keep up his checkbook balance. When he finally balanced his account, he found that the balance was -\$23.75, so he deposited \$50.00. What is his new balance?

17. Mike O'Hanian owed a friend \$28. He repaid \$13, but then borrowed another \$14. What positive or negative amount represents his present financial status?
18. Peyton Manning of the Indianapolis Colts passed for a gain of 8 *yd*, was sacked for a loss of 12 *yd*, and then threw a 42 *yd* touchdown pass. What positive or negative number represents the total net yardage for the plays?
19. If the temperature drops  $7^{\circ}$  below its previous level of  $-3^{\circ}$ , what is the new temperature?
20. Evaluate  $6x - 4z$ , if  $x = -5$  and  $z = -3$
21. Evaluate  $3x - 4y^2$ , if  $x = -2$  and  $y = 4$
22. Evaluate  $6x - 4z$ , if  $x = -5$  and  $z = -3$
23. Evaluate  $z^2(3x - 8y)$ , if  $x = -5$ ,  $y = 4$ , and  $z = -3$
24. Combine like terms:  $-5(5y - 9) + 3(3y + 6)$
25. Combine like terms:  $-2(3r - 4) - (6 - r) + 2r - 5$
26. Combine like terms:  $2p^2 + 3p^2 - 8p^3 - 6p^3$
27. Combine like terms:  $6 - 3z - 2z - 5 + z - 3z$

## Chapter 2.

1. Solve the equation and check your solution:  $6x + 5 + 7x + 3 = 12x + 4$
2. Solve the equation and check your solution:  $4(k - 6) - (3k + 2) = -5$
3. Solve the equation and check your solution:  $(5y + 6) - (3 + 4y) = 10$
4. Solve the equation and check your solution:  $2(2 - 3r) = -5(r - 3)$
5. Solve the equation and check your solution:  $4x + 3x = 21$
6. Solve the equation and check your solution:  $5m + 6m - 2m = 63$
7. Solve the equation and check your solution:  $11r - 5r + 6r = 168$
8. Solve the equation and check your solution:  $9p - 13p = 24$

9. Solve the equation and check your solution:  $5(2m + 3) - 4m = 8m + 27$
10. Solve the equation and check your solution:  $6(4x - 1) = 12(2x + 3)$
11. Solve the equation and check your solution:  $3(2x - 4) = 6(x - 2)$
12. Solve the equation and check your solution:  $7r - 5r + 2 = 5r - r$
13. The sum of three times a number and 7 more than the number is the same as the difference between  $-11$  and twice the number. What is the number?
14. During the 109<sup>th</sup> Congress (2005-2006), the U.S. Senate had a total of 99 Democrats and Republicans. There were 11 more Republicans than Democrats. How many Democrats and Republicans were there in the Senate?
15. In one day, a store sold  $\frac{8}{5}$  as many DVDs as CDs. The total number of DVDs and CDs sold that day was 273. How many DVDs were sold?
16. In her job as a mathematics textbook editor, Lauren Morse works  $7.5 \text{ hr}$  a day. She spent a recent day making telephone calls, writing e-mails, and attending meetings. On that day, she spent twice as much time attending meetings as making telephone calls and spent  $0.5 \text{ hr}$  longer writing e-mails than making telephone calls. How many hours did she spend on each task?
17. The supplement of an angle measures 10 times the measure of its complement. What is the measure of the angle?
18. Find two consecutive odd integers such that when the lesser is added to twice the greater, the result is 24 more than the greater integer.
19. The perimeter of a certain rectangle is 16 times the width. The length is  $12 \text{ cm}$  more than the width. Find the width of the rectangle.
20. Two trains are  $390 \text{ mi}$  apart. They start at the same time and travel toward one another, meeting  $3 \text{ hr}$  later. If the speed of one train is  $30 \text{ mph}$  more than the speed of the other train, find the speed of each train.
21. The perimeter of a triangle is  $96 \text{ m}$ . One side is twice as long as another and the third side is  $30 \text{ m}$  long. What is the length of the longest side?
22. The perimeter of a basketball court is  $288 \text{ ft}$ . The width of the court is  $44 \text{ ft}$  less than the length. What are the dimensions of the court?
23. Solve the formula  $d = rt$  for  $t$

24. Solve the formula  $P = 2L + 2W$  for  $W$
25. Solve the formula  $M = C(1+r)$  for  $r$
26. Solve the formula  $C = \frac{5}{9}(F - 32)$  for  $F$
27. Solve the formula  $A = \frac{1}{2}h(b+B)$  for  $h$
28. Solve the equation  $\frac{x}{6} = \frac{18}{4}$
29. Solve the equation  $\frac{3y-2}{5} = \frac{6y-5}{11}$
30. If 6 gal of premium unleaded gasoline costs \$19.56, how much would it cost to completely fill a 15-gal tank?
31. The distance between Singapore and Tokyo is 3300 mi. On a certain wall map, this is represented by 11 in. The actual distance between Mexico City and Cairo is 7700 mi. How far apart are they on the same map?
32. Solve the inequality  $6x + 3 + x < 2 + 4x + 4$
33. Solve the inequality  $5(x+3) - 6x \leq 3(2x+1) - 4x$
34. Solve the inequality  $-5 \leq 2x - 3 \leq 9$
35. Solve the inequality  $-1 \leq 1 - 5q \leq 16$

### Chapter 3.

- Find the  $x$ -intercept and  $y$ -intercept:  $2x - 3y = 24$
- Find the  $x$ -intercept and  $y$ -intercept:  $5x - 2y = 20$
- Find the  $x$ -intercept and  $y$ -intercept:  $y + 1.5 = 0$
- Find the  $x$ -intercept and  $y$ -intercept:  $x - 4 = 0$
- Find the slope of the line through pair of points:  $(4, -1)$  and  $(-2, -8)$

6. Find the slope of the line through pair of points:  $(-8, 0)$  and  $(0, -5)$
7. Find the slope of the line through pair of points:  $(-8, 6)$  and  $(-8, -1)$
8. Find the slope of the line through pair of points:  $(6, -5)$  and  $(-12, -5)$
9. For the pair of equation, give the slopes of the lines and then determine whether the two lines are parallel, perpendicular, or neither parallel nor perpendicular.
- $$\begin{cases} 2x + 5y = 4 \\ 4x + 10y = 1 \end{cases}$$
10. For the pair of equation, give the slopes of the lines and then determine whether the two lines are parallel, perpendicular, or neither parallel nor perpendicular.
- $$\begin{cases} 3x - 2y = 6 \\ 2x + 3y = 3 \end{cases}$$
11. For the pair of equation, give the slopes of the lines and then determine whether the two lines are parallel, perpendicular, or neither parallel nor perpendicular.
- $$\begin{cases} 8x - 9y = 6 \\ 8x + 6y = -5 \end{cases}$$
12. For the pair of equation, give the slopes of the lines and then determine whether the two lines are parallel, perpendicular, or neither parallel nor perpendicular.
- $$\begin{cases} 5x - y = 1 \\ x - 5y = -10 \end{cases}$$
13. Write an equation for the line passing through the given point and having the given slope. Give the final answer in slope-intercept form:  $(4, 1)$ ,  $m = 2$
14. Write an equation for the line passing through the given point and having the given slope. Give the final answer in slope-intercept form:  $(-2, 5)$ ,  $m = \frac{2}{3}$
15. Write an equation for the line passing through the given point and having the given slope. Give the final answer in slope-intercept form:  $(-1, 3)$ ,  $m = -4$
16. Write an equation for the line passing through the given point and having the given slope. Give the final answer in slope-intercept form:  $(2, 7)$ ,  $m = 3$
17. Write an equation for the line passing through the given pair of points. Give the final answer in slope-intercept form.  $(8, 5)$  and  $(9, 6)$

18. Write an equation for the line passing through the given pair of points. Give the final answer in slope-intercept form.  $(4,10)$  and  $(6,12)$
19. Write an equation for the line passing through the given pair of points. Give the final answer in slope-intercept form.  $(-2,-1)$  and  $(3,-4)$
20. Write an equation for the line passing through the given pair of points. Give the final answer in slope-intercept form.  $(-4,0)$  and  $(0,2)$
21. Graph the linear inequality:  $3x + 5y > 9$
22. Graph the linear inequality:  $2x - 3y > -6$
23. Graph the linear inequality:  $x - 2y \geq 0$

### Chapter 4.

1. Decide whether the given ordered pair is a solution of the given system.  
 $(3,4)$   

$$\begin{cases} 4x - 2y = 4 \\ 5x + y = 19 \end{cases}$$
2. Decide whether the given ordered pair is a solution of the given system.  
 $(-5,2)$   

$$\begin{cases} x - 4y = -13 \\ 2x + 3y = 4 \end{cases}$$
3. Solve the system by graphing:  

$$\begin{cases} x + y = 4 \\ 2y - y = 5 \end{cases}$$
4. Solve the system by graphing:  

$$\begin{cases} x - 2y = 4 \\ 2y + y = -2 \end{cases}$$
5. Solve the system by the substitution method.  

$$\begin{cases} 3x - 2y = 19 \\ x + y = 8 \end{cases}$$

6. Solve the system by the substitution method.
- $$\begin{cases} 2x + y = 0 \\ 4x - 2y = 2 \end{cases}$$
7. Solve the system by the substitution method.
- $$\begin{cases} x + y = 12 \\ y = 3x \end{cases}$$
8. Solve the system by the substitution method.
- $$\begin{cases} 2y = 14 - 6x \\ 3x + y = 7 \end{cases}$$
9. Solve the system by the elimination method.
- $$\begin{cases} 2x + y = -5 \\ x - y = 2 \end{cases}$$
10. Solve the system by the elimination method.
- $$\begin{cases} 2x - y = 12 \\ 3x + 2y = -3 \end{cases}$$
11. Solve the system by the elimination method.
- $$\begin{cases} 3x = 3 + 2y \\ -\frac{4}{3}x + y = \frac{1}{3} \end{cases}$$
12. Solve the system by the elimination method.
- $$\begin{cases} 5x - 2y = 3 \\ 10x - 4y = 5 \end{cases}$$
13. Bill Kunz went to the post office to stock up on stamps. He spent \$19.44 on 56 stamps, made up of a combination of 39-cent and 24-cent stamps. How many stamps of each denomination did he buy?
14. A 40% dye solution is to be mixed with a 70% dye solution to get 120 L of a 50% solution. How many liters of the 40% and 70% solutions will be needed?
15. Two trains start from towns 495 *mi* apart and travel toward each other on parallel tracks. They pass each other 4.5 *hr* later. If one train travels 10 *mph* faster than the other, find the speed of each train.
16. If a plane can travel 440 *mph* into the wind and 500 *mph* with the wind, find the speed of the wind and the speed of the plane in still air.

17. Nancy Johnson invested \$18,000. Part of it was invested at 3% annual simple interest, and the rest was invested at 4%. Her interest income for the first year was \$650. How much did she invest at each rate?

18. Graph the solution set of the system of linear inequalities.

$$\begin{cases} x + y \geq 2 \\ x - y \leq 4 \end{cases}$$

19. Graph the solution set of the system of linear inequalities.

$$\begin{cases} y \geq 2x \\ 2x + 3y \leq 6 \end{cases}$$

## Chapter 5.

1. Simplify:  $(3x^4y^2z)^3(yz^4)^5$

2. Simplify:  $\left(\frac{5a^2b^5}{c^6}\right)^3$

3. Simplify:  $\left(\frac{6x^3y^9}{z^5}\right)^4$

4. Simplify:  $(-r^4s)^2(-r^2s^3)^5$

5. Simplify. Use only positive exponents:  $(6x^{-5}z^3)^{-3}$

6. Simplify. Use only positive exponents:  $\frac{(2xy^{-1})^3}{2^3x^{-3}y^2}$

7. Simplify. Use only positive exponents:  $(-r^4s)^2(-r^2s^3)^5$

8. Simplify. Use only positive exponents:  $\left(\frac{mn^{-2}p}{m^2np^4}\right)^{-2}\left(\frac{mn^{-2}p}{m^2np^4}\right)^3$

9. Perform the operation:  $(9a^4 - 3a^2 + 2) + (4a^4 - 4a^2 + 2) + (-12a^4 + 6a^2 - 3)$

10. Perform the operation:  $(8m^2 - 7m) - (3m^2 + 7m - 6)$

11. Perform the operation:  $(6b + 3c) + (-2b - 8c)$

12. Perform the operation:  $(4x + 2xy - 3) - (-2x + 3xy + 4)$
13. Find the product:  $(m + 7)(m + 5)$
14. Find the product:  $(2m - 3n)(m + 5n)$
15. Find the product:  $3p^3(2p^2 + 5p)(p^3 + 2p + 1)$
16. Find the product:  $(2a + 1)^3$
17. Find the product. Use special product formulas to simplify:  $(a + 8)(a - 8)$
18. Find the product. Use special product formulas to simplify:  $(m + 2)^2$
19. Find the product. Use special product formulas to simplify:  $(5y + 3x)(5y - 3x)$
20. Find the product. Use special product formulas to simplify:  $(z - 5)^2$
21. Find the product. Use special product formulas to simplify:  $(2r + 5t)^2$
22. Find the product. Use special product formulas to simplify:  $(6m - 5)(6m + 5)$
23. Find the product. Use special product formulas to simplify:  $p(3p + 7)(3p - 7)$
24. Find the product. Use special product formulas to simplify:  $\left(\frac{3}{4} - x\right)\left(\frac{3}{4} + x\right)$
25. Find the product. Use special product formulas to simplify:  $-(4r - 2)^2$
26. Perform the division:  $\frac{8t^5 - 4t^3 + 4t^2}{2t}$
27. Perform the division:  $\frac{20m^5 - 10m^4 + 5m^2}{5m^2}$
28. Perform the division:  $(-10m^4n^2 + 5m^3n^2 + 6m^2n^4) \div 5m^2n$
29. Perform the division:  $\frac{2r^3 - 5r^2 - 6r + 15}{r - 3}$

30. Perform the division:  $\frac{16x^2 - 25}{4x + 5}$

31. Perform the division:  $\frac{5 - 2r^2 + r^4}{r^2 - 1}$

### Chapter 6.

1. Factor completely:  $8m^2n^3 + 24m^2n^2$

2. Factor completely:  $5m^2 + 15mp - 2mr - 6pr$

3. Factor completely:  $16m^3 - 4m^2p^2 - 4mp + p^3$

4. Factor completely:  $36p^6q + 45p^5q^4 + 81p^3q^2$

5. Factor completely:  $r^2 + 3ra + 2a^2$

6. Factor completely:  $5y^2 - 5y - 30$

7. Factor completely:  $m^3n - 2m^2n^2 - 3mn^3$

8. Factor completely:  $(a + b)x^2 + (a + b)x - 12(a + b)$

9. Factor completely:  $6x^2 - 17x + 12$

10. Factor completely:  $2t^2 + 13t - 18$

11. Factor completely:  $12s^2 + 11st - 5t^2$

12. Factor completely:  $18 + 65x + 7x^2$

13. Factor completely:  $x^4 - 1$

14. Factor completely:  $32a^2 - 8$

15. Factor completely:  $x^2 - 10x + 25$

16. Factor completely:  $2x^2 + 24a + 72$

17. Factor completely:  $27t^3 - 64s^6$

18. Factor completely:  $125t^3 + 8s^6$
19. Factor completely:  $16r^2 - 25a^2$
20. Factor completely:  $81w^2 + 16$
21. Solve the equation:  $(2x + 7)(x^2 + 2x - 3) = 0$
22. Solve the equation:  $x^2 + (x + 1)^2 = (x + 2)^2$
23. Solve the equation:  $x^3 = 3x + 2x^2$
24. Solve the equation:  $16r^3 - 9r = 0$
25. A certain triangle has its base equal in measure to its height. The area of the triangle is  $72 \text{ m}^2$ . Find the base and height measure.
26. The product of the second and third of three consecutive integers is 2 more than 10 times the first integer. Find the integers.
27. A ladder is leaning against a building. The distance from the bottom of the ladder to the building is 4 *ft* less than the length of the ladder. How high up the side of the building is the top of the ladder if that distance is 2 *ft* less than the length of the ladder.
28. An object projected from a height of 48 *ft* with an initial velocity of 32 *ft per sec* after  $t$  seconds has height  $h = -16t^2 + 32t + 48$
- (a) After how many seconds is the height 64 *ft*?
- (b) After how many seconds does the object hit the ground?

## Chapter 7.

1. Write the rational expression in lowest terms:  $\frac{7t^2 - 31t - 20}{7t + 4}$
2. Write the rational expression in lowest terms:  $\frac{x^2 + 2x - 15}{x^2 + 6x + 5}$
3. Write the rational expression in lowest terms:  $\frac{5k^2 - 13k - 6}{5k + 2}$

4. Write the rational expression in lowest terms:  $\frac{2x^2 - 3x - 5}{2x^2 - 7x + 5}$
5. Multiply:  $\frac{3x^2 - 5x - 2}{x - 2} \cdot \frac{x - 3}{x + 1}$
6. Multiply:  $\frac{2k^2 + 3k - 2}{6k^2 - 7k + 2} \cdot \frac{4k^2 - 5k + 1}{k^2 + k - 2}$
7. Divide:  $\frac{m^2 + 2mp - 3p^2}{m^2 - 3mp + 2p^2} \div \frac{m^2 + 4mp + 3p^2}{m^2 + 2mp - 8p^2}$
8. Divide:  $\frac{(q - 3)^4 (q + 2)^2}{q^2 + 3q + 2} \div \frac{q^2 - 6q + 9}{q^2 + 4q + 4}$
9. Add:  $\frac{4m}{m^2 + 3m + 2} + \frac{2m - 1}{m^2 + 6m + 5}$
10. Add:  $\frac{a}{a^2 + 3a - 4} + \frac{4a}{a^2 + 7a + 12}$
11. Perform indicated operation:  $\frac{2x - z}{2x^2 + xz - 10z^2} - \frac{x + z}{x^2 - 4z^2}$
12. Perform indicated operation:  $\frac{6}{k^2 + 3k} - \frac{1}{k^2 - k} + \frac{2}{k^2 + 2k - 3}$
13. Simplify:  $\frac{\frac{1}{-} + x}{\frac{x}{x^2 + 1}}$   
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14. Simplify:  $\frac{\frac{1}{m+1} - 1}{\frac{1}{m+1} + 1}$
15. Simplify:  $\frac{\frac{1}{m-1} + \frac{2}{m+2}}{\frac{2}{m+2} - \frac{1}{m-3}}$

16. Simplify:  $1 + \frac{1}{1 + \frac{1}{1+1}}$
17. Solve the equation and check your solutions:  $\frac{2p}{p^2 - 1} = \frac{2}{p+1} - \frac{1}{p-1}$
18. Solve the equation and check your solutions:  $\frac{k}{k-4} - 5 = \frac{4}{k-4}$
19. Solve the equation and check your solutions:  $\frac{-2}{z+5} + \frac{3}{z-5} = \frac{20}{z^2 - 25}$
20. Solve the equation and check your solutions:  

$$\frac{x+4}{x^2 - 3x + 2} - \frac{5}{x^2 - 4x + 3} = \frac{x-4}{x^2 - 5x + 6}$$
21. One-third of a number is 2 more than one-sixth of the same number. What is the number?
22. A boat can go 20 *mi* against a current in the same time that it can go 60 *mi* with the current. The current is 4 *mph*. Find the speed of the boat in still water.
23. Working alone, Jorge can paint a room in 8 *hr*. Caterina can paint the same room working alone in 6 *hr*. How long will it take them if they work together?
24. One pipe can fill a swimming pool in 6 *hr*, and another pipe can do it in 9 *hr*. How long will it take the two pipes working together to fill the pool  $\frac{3}{4}$  full?

## Chapter 8.

1. Find the square root:  $\sqrt{3^2 + 4^2}$
2. Find the square root:  $\sqrt{5^2 + 12^2}$
3. Find the distance between the pair of points: (5,7) and (1,4)
4. Find the distance between the pair of points: (-3,-6) and (-4,0)
5. Simplify:  $\sqrt{81m^4n^2}$

6. Simplify:  $\sqrt{\frac{x^4 y^6}{169}}$
7. Simplify:  $\sqrt{\frac{w^8 z^{10}}{400}}$
8. Simplify:  $\sqrt[3]{\frac{n^9}{27}}$
9. Simplify and combine like terms where possible:  $3\sqrt{8x^2} - 4x\sqrt{2}$
10. Simplify and combine like terms where possible:  $3\sqrt{75} + 2\sqrt{27}$
11. Simplify and combine like terms where possible:  $4\sqrt{24} - 3\sqrt{54} + \sqrt{6}$
12. Simplify and combine like terms where possible:  $\sqrt{50m^2} - m\sqrt{45}$
13. Simplify and combine like terms where possible:  $3k\sqrt{8k^2n} + 5k\sqrt{2n}$
14. Perform indicated operation:  $\sqrt{(-3-6)^2 + (2-4)^2}$
15. Simplify the radical:  $\sqrt{x^{10}y^{16}}$
16. Simplify the radical:  $\sqrt{a^{15}b^{21}}$
17. Simplify the radical:  $\sqrt{121x^6y^{10}}$
18. Simplify the radical:  $\sqrt{\frac{m^2n}{2}}$
19. Simplify the radical:  $\sqrt{\frac{2x^2z^4}{3y}}$
20. Rationalize the denominator:  $\frac{7}{2-\sqrt{11}}$
21. Rationalize the denominator:  $\frac{3+\sqrt{2}}{\sqrt{2}+1}$

22. Rationalize the denominator:  $\frac{8}{4-\sqrt{x}}$
23. Rationalize the denominator:  $\frac{1}{\sqrt{x}+\sqrt{y}}$
24. Solve the equation:  $\sqrt{x+2} = 3$
25. Solve the equation:  $\sqrt{5x+11} = x+3$
26. Solve the equation:  $\sqrt{3x+3} + \sqrt{x+2} = 5$
27. Solve the equation:  $\sqrt[3]{2x} = \sqrt[3]{5x+2}$
28. Simplify:  $x^{2/5} \cdot x^{7/5}$
29. Simplify:  $(p^4 q^{1/2})^{4/3}$
30. Simplify:  $\frac{q^{5/6} \cdot q^{-1/6}}{q^{1/3}}$
31. Simplify:  $(m^3 n^{1/4})^{2/3}$

## Chapter 9.

1. Solve the equation by using square root property:  $(5z+6)^2 = 75$
2. Solve the equation by using square root property:  $(4x-3)^2 = 9$
3. Solve the equation by using square root property:  $(4k-1)^2 - 48 = 0$
4. Solve the equation by using square root property:  $(m+2)^2 = 17$
5. Solve the equation by completing the square:  $4x^2 + 4x = 3$
6. Remove parentheses and solve the equation by completing the square:  
 $(r-3)(r-5) = 2$
7. Solve the equation by completing the square:  $3k^2 + 7k = 4$
8. Solve the equation by completing the square:  $(k-1)(k-7) = 1$

9. Use the quadratic formula to solve the equation:  $r^2 - 8r - 9 = 0$
10. Use the quadratic formula to solve the equation:  $(2x+1)(x+1) = 7$
11. Use the quadratic formula to solve the equation:  $2x^2 + x - 5 = 0$
12. Use the quadratic formula to solve the equation:  $4x^2 - x + 4 = x + 7$
13. A farmer has a rectangular cattle pen with perimeter  $350 \text{ ft}$  and area  $7500 \text{ ft}^2$ . What are the dimensions of the pen?
14. The base of a triangle measures  $1 \text{ m}$  more than three times the height of the triangle. The area of the triangle is  $15\text{m}^2$ . Find the lengths of the base and the height.
15. If an object is projected vertically into the air from ground level on Earth with an initial velocity of  $64 \text{ ft per sec}$ . Its altitude (height)  $s$  in feet after  $t$  seconds is given by the formula:  $s = -16t^2 + 64t$ .  
At what time will the object be at a height of  $64 \text{ ft}$ ?
16. In a right triangle, the lengths of the sides are consecutive integers. Use the Pythagorean formula to find these lengths.