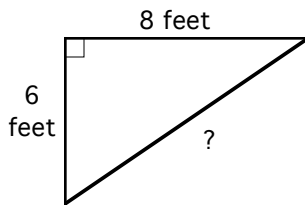


Name \_\_\_\_\_ Instructor \_\_\_\_\_ Score \_\_\_\_\_

There are 5 bonus points on this exam; maximum score is 105. Read directions carefully. Good Luck!

1. Find the value of:  $\sqrt{25} \div (7 - 3 \cdot 4)$  1. \_\_\_\_\_ (2)
2. Find the value of:  $\frac{64 - 2^5}{24}$  2. \_\_\_\_\_ (2)  
(fraction in lowest terms)
3. Find the value of:  $5^{-1} + (2k)^0$  3. \_\_\_\_\_ (2)  
(fraction in lowest terms or decimal)
4. Evaluate  $x^2 - 3x$  when  $x = -4$ . 4. \_\_\_\_\_ (2)
5. In each pair, fill in the blank with  $>$ ,  $<$ , or  $=$  to complete the comparison correctly.  
 $|-10|$  \_\_\_\_\_  $-10$        $3.2$  \_\_\_\_\_  $3\frac{1}{2}$        $-(-5)$  \_\_\_\_\_  $\frac{50}{10}$  (3)
6. A U.S. dime is about 0.053 inches thick. Write this number in scientific notation. 6. \_\_\_\_\_ (2)
7. The distance around the earth measured along the equator is about  $4.01 \times 10^4$  kilometers. Write this number in expanded form. 7. \_\_\_\_\_ (1)
8. Write an **expression** for the sum of three consecutive integers and simplify it as much as possible. Use "n" for the first integer. 8. \_\_\_\_\_ (2)
9. You and 4 friends evenly divide the total bill at a restaurant. If the total bill is B dollars, write an **equation** for S, your share of the total bill. 9. \_\_\_\_\_ (2)
10. When a fisherman in Minnesota got up at 4 a.m., the temperature was  $-4^\circ\text{F}$ , and when he returned to the dock at 3 p.m. it was  $11^\circ\text{F}$ . What was the change in temperature he experienced? 10. \_\_\_\_\_ (2)

11. Currently, your yard is covered with grass. For spring, you are planning a flower garden for the corner of your yard in the shape of the right triangle shown below.



- a. What will be the length of the longest side of your new garden? Show work and include units with your answer for full credit.

\_\_\_\_\_ (3)  
number      units

- b. You must tear out all the grass growing in this triangular plot to make room for the flowers. What is the area of the lawn you must remove? Include units with your answer for full credit. HINT: area =  $(1/2)(\text{base})(\text{height})$

\_\_\_\_\_ (3)  
number      units

For problems 12, 13, 14, and 15, use the properties of exponents to simplify the expressions. Write your answers with positive exponents only.

12.  $\frac{15c^{15}}{3c^{10}} =$  12. \_\_\_\_\_ (2)

13.  $(n^9p)^2 =$  13. \_\_\_\_\_ (2)

14.  $\left(\frac{7}{v}\right)^{-2} =$  14. \_\_\_\_\_ (2)

15.  $-3x^2 \cdot x^4 \cdot 6x^1 =$  15. \_\_\_\_\_ (2)

16. Solve for x:  $\frac{3}{11} \cdot x = 21$  16. x = \_\_\_\_\_ (2)

17. Solve for A:  $30 - 12A = 24$  17. A = \_\_\_\_\_ (2)  
(fraction in lowest terms or decimal)

18. Solve for y:  $4x + 5y = 10$

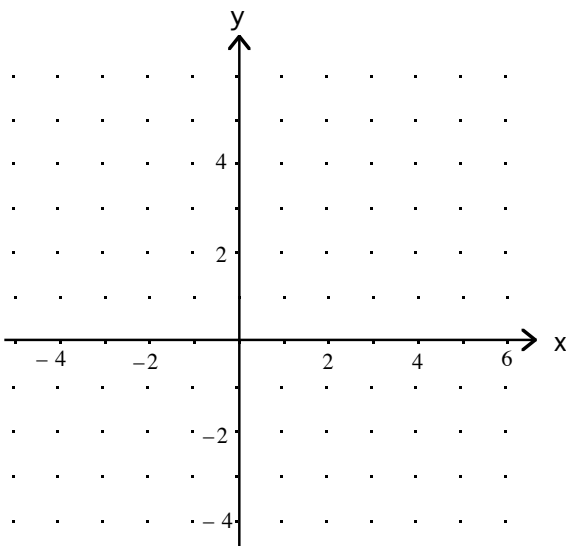
18.  $y = \underline{\hspace{2cm}}$  (2)

19. Solve for t:  $10 + 0.3t + 0.2(t - 4) = 4.2$

19.  $t = \underline{\hspace{2cm}}$  (3)

20. Bob has a very old car that he'd like to replace. The old car costs \$250 each month for repairs, \$120 each month for gas, and \$60 each month for insurance. A friend is willing to sell him a reliable used car for \$7800. In addition to the price of the car, this used car will cost \$90 each month for gas and \$80 each month for insurance. If Bob buys the used car, how long will it take before he begins to save money on car expenses? You must use a variable to write an equation and show your work for full credit.

20.  $\underline{\hspace{2cm}}$  (4)



21. Line A is the line that passes through the point  $(-5, 5)$  with slope  $m = -\frac{1}{3}$ . Graph line A on the grid at the left. (3)

22. The equation of line B is  $y = x - 2$ . Graph line B on the same grid with line A. (3)

23. The solution to a system of linear equations is a point  $(x, y)$  where the two lines intersect. What is the solution to the system of the two equations for lines A and B?

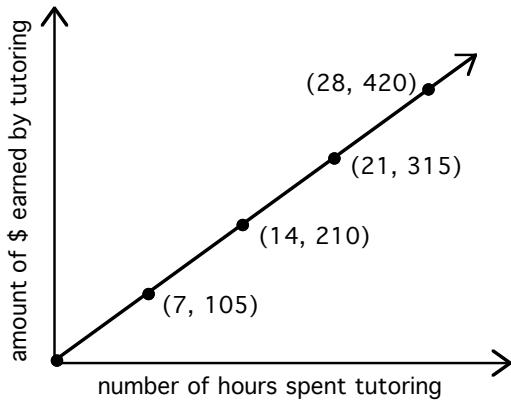
$( \quad , \quad )$  (2)

24. Find the x- and y-intercepts of the line  $4x + 5y = 10$ .

Write any fraction answers in lowest terms.

x-intercept = (      ,      ) (2)

y-intercept = (      ,      ) (2)



Use this graph that shows the earnings of a math tutor to answer the questions 25a and 25b.

25a. What is the slope of the line in the graph? (2)

m = \_\_\_\_\_

25b. Write a sentence that explains what the slope means to the tutor. (2)

For problems 26 through 29, perform the indicated operations (+, -, x), and then simplify as much as possible by combining like terms.

26.  $4p - 3(p - 5)$

26. \_\_\_\_\_ (2)

27.  $5v^3 - 7v^2 + 10v^2 - 5v^3$

27. \_\_\_\_\_ (2)

28.  $(n - 9)(n + 2)$

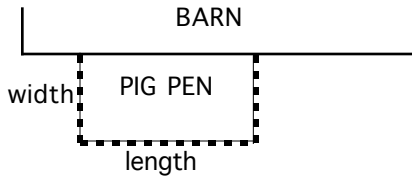
28. \_\_\_\_\_ (3)

29.  $(2k - 5)(2k + 5)$

29. \_\_\_\_\_ (3)

30. A ski resort sells 180 adult lift tickets, 50 child lift tickets, and 20 senior lift tickets on a weekday. What percentage of the lift tickets sold are adult tickets? 30. \_\_\_\_\_ (2)

31. A farmer wants to build a small, rectangular pig pen next to a barn. She has 50 feet of fence available and needs the length of the pen to be twice the width. If the barn forms the fourth side of the pen as shown in the figure below, what dimensions (length and width) should the pen be so that all 50 feet of fence are used for the other three sides? You must use a variable to write an equation, show your work, and label your answers with the correct units for full credit. (5)



The equation I need to solve is: \_\_\_\_\_

$$\text{length} = \frac{\quad}{\text{number}} \quad \frac{\quad}{\text{units}}$$

$$\text{width} = \frac{\quad}{\text{number}} \quad \frac{\quad}{\text{units}}$$

32. A toy rocket is launched vertically into the air. Its height above the ground is given by  $H = -16t^2 + 80t$ , where  $H$  represents the rocket's height in feet and  $t$  represents the number of seconds since it was launched. How high is the rocket after 3 seconds?

33. \_\_\_\_\_ (2)

Factor the expressions in problems 33, 34, and 35 **completely**.

33.  $40w^2b + 8wb^3$  33. \_\_\_\_\_ (3)

34.  $y^2 - 17y - 60$  34. \_\_\_\_\_ (3)

35.  $m^2 + 11m + 28$  35. \_\_\_\_\_ (3)

36. Divide and simplify:  $\frac{x^2a + 2x^2}{2x^2}$  36. \_\_\_\_\_ (3)

37. Solve for y:  $(y + 3)(4y - 8) = 0$  37.  $y =$  \_\_\_\_\_ (2)

38. Solve for r:  $r^2 + 6r = -9$  38.  $r =$  \_\_\_\_\_ (4)

## BONUS QUESTIONS

Below is part of the IRS tax table for single individuals filing their 2006 income tax return.

If a taxpayer's income is		then estimated taxes are			
at or above	but not over	base tax	+	rate	× the amount over
\$0	\$7,550	\$0		10%	\$0
\$7,550	\$30,650	\$755		15%	\$7,550
\$30,650	\$74,200	\$4220		25%	\$30,650

A full-time student earned \$7250 while working during the summer. How much tax will he pay? \_\_\_\_\_ (1)

How much tax will a person who earned \$70,000 in 2006 pay? \_\_\_\_\_ (2)

Carmella began working last June, and she earned \$29,550 by the end of 2006.

How much will Carmella pay in taxes? \_\_\_\_\_ (1)

What is Carmella's "take home" pay? (after taxes) \_\_\_\_\_ (1)