

Name: _____ Instructor: _____ score ____/100

**M098 Spring 2001
Departmental Final Exam - Form A**

1) Add: $(5x^2 + 7x + 6) + (3x^2 - 5x + 14)$ _____
2 pts

2) Subtract: $4(3x + 2) - 3(5x - 3)$ _____
2 pts

3) Multiply: $(5x - 4)(2x + 1)$ _____
2 pts

4) Factor: $4x^2 - 4x - 8$ _____
2 pts

5) Reduce: $\frac{3a^5b}{15a^2b^3}$ _____
2 pts

6) Simplify: $(6x^{-4})(4x^6)$ _____
2 pts

7) Add: $3^{-1} + 5^{-1}$ _____
2 pts

8) Reduce: $\frac{p^2 - 6p}{3p - 18}$ _____
2 pts

9) Add: $\frac{2}{3x} + \frac{5}{6y}$ _____
2 pts

10) Rewrite in simplest radical form: $\sqrt{50x^3y^6}$ _____
2 pts

11) Solve for x: $6x + 5 = 4x + 3$ $x =$ _____
3 pts

12) Solve for x: $y = mx + b$

$x =$ _____
[formula] 3 pts

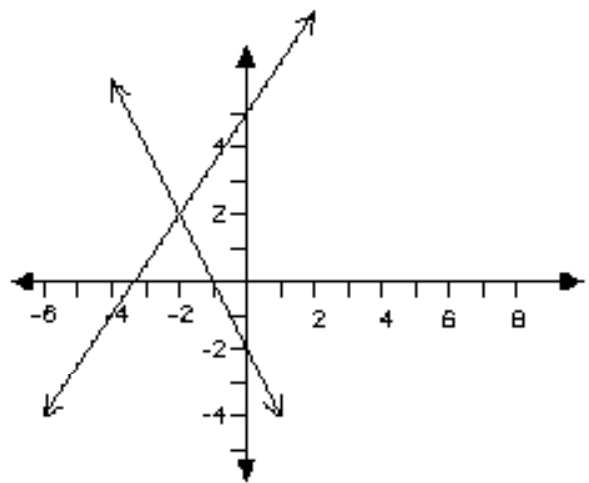
13) Solve for x: $x^2 = x + 20$

$x =$ _____
3 pts

14) Solve for x: $\frac{1}{x} - \frac{2}{5x} = \frac{6}{5}$

$x =$ _____
3 pts

15) The graph below represents a system of two equations in two unknowns. What is the solution to the system?



Solution: _____
3 pts.

16) Solve the following system:

$$\begin{aligned} 5x + 2y &= 10 \\ 3x - y &= 7 \end{aligned}$$

Solution is _____
3 pts

- 17) Use the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ to solve the following:

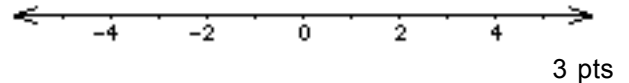
$$3x^2 + 7x + 1 = 0$$

$x =$ _____
3 pts

- 18) Solve for a: $\frac{5a - 3}{a} = 3$

$a =$ _____
3 pts

- 19) Graph the solutions of: $2x + 3 \leq 7$



- 20) Solve for n: $25n^2 = 49$

$n =$ _____
3 pts

- 21) Solve for x: $2^{x+1} = 16$

$x =$ _____
3 pts

- 22) Solve for y: $\sqrt{3y - 2} = y$

$y =$ _____
3 pts

- 23) Find the equation of the line (in slope-intercept form) that contains the two points (1, 3) and (3,11).

4 pts

24) I can rent a chain saw at a local dealer for a \$20 plus \$7.50 per day.

a) How much would it cost to rent a saw for 3 days?

_____ 1 pt

b) Let y stand for the total cost, and x the number of days we could rent a saw. Write an equation for y in terms of x .

$y =$ _____ 2 pts

c) What does the y -intercept mean, in this context?

_____ 1 pt

25) The manager of a bicycle store knows that there is a relation between the number of bicycles that will sell (N) and the price per bike (P). In fact,

$$P = 150 - \frac{N}{4}$$

a) Find an equation relating the total amount of money the dealer would make (revenue) from selling N bicycles. [Hint: revenue = price per item TIMES number sold]

revenue = _____ 2 pts

b) How many bicycles should the dealer sell to maximize his revenue?

$N =$ _____ 2 pts

26) Cicelia's odometer read 112 miles when she filled up her 14-gallon gas tank and 308 when the gas gauge read half full.

- a) Express the odometer reading, M , in terms of the amount of gas, g , she has used. [Assume the relation is linear.]

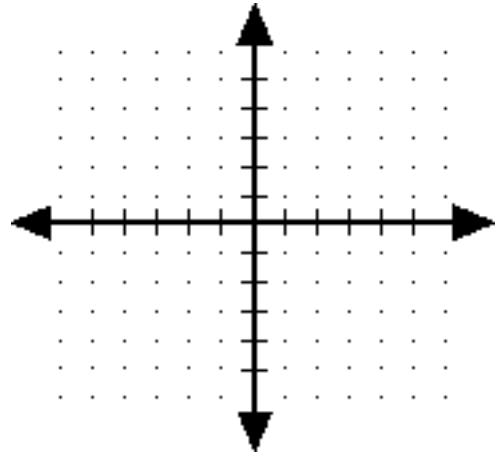
$M =$ _____
2 pts

- b) What does the slope mean, in this context?

1 pt

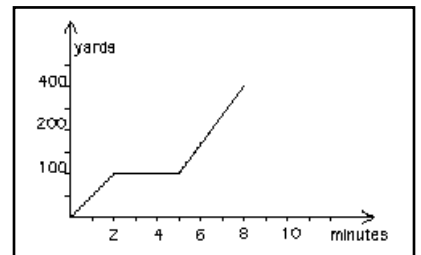
27) Find the intercepts and vertex of $y = 2x^2 - 4x - 6$ [1 pt each]

- a) y-intercept _____
b) x-intercepts _____
c) vertex _____
d) sketch the graph



28) Jennifer left from class and headed to the espresso stand. Along the way she met a friend, and stopped to chat for a while.

- a) How long did she talk with her friend? 1 pt
b) How far away is the espresso stand? 1 pt
c) How long did it take her to get to the stand? 1 pt



29) The lawn in my front yard is 80 feet wide, and 200 feet long. Before I even start mowing, I have two questions:

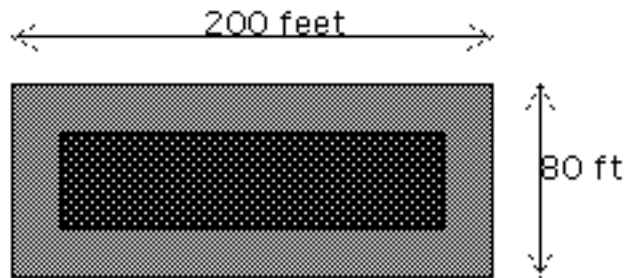
a) What is the total area of my lawn?

area = _____
1 pt

b) If I can mow at a rate of 800 sq. ft. per minute, how long would it take to mow the lawn?

_____ 2 pts

I mowed for a while and then took a break. I usually start from the outside, and work my way in. Suppose I've done that, mowing an even strip, 20 feet wide, all around the lawn. (See drawing.) While on break, two questions occur to me:



c) What area do I have left to go? [The dark portion in the drawing.]

area left = _____
2pts

c) What per cent of (the total) area do I have left to do?

per cent left = _____
2 pts

30) A few friends and I went to see the incredible Mariners the other night. I made the first food run, purchased 5 cokes and 4 hot-dogs and it cost me 52 dollars (ignoring tax). Later in the game, I made another trip for 3 cokes and 2 hot-dogs and paid 29 dollars (ignoring taxes).

Let C = the price per coke
and D = the price per hot dog

a) Write an equation, involving C and D , expressing the amount of money spent on my first trip.

1 pt

b) Write an equation, involving C and D , expressing the amount of money spent on my second trip.

1 pt

c) Solve the system made up by your answers to (a) and (b).

2 pts

d) What is the price per hot dog?

1 pt

31) I have a thirty-five dollar gift certificate to Spazzo's. I have to pay a tax of 8.9% (based on the price of food I order). I'd also like to leave a 20% tip (based on the price of food I order). How much can I spend on food (alone) if I want to use up the entire gift certificate?

Your answer: _____

5 pts

32) A friend of mine sells hand thrown plates at craft fairs. She knows that the number (N) that will sell varies inversely as the price per plate (P). She also knows that at 12 dollars each, she'll sell (on average) 40 plates.

a) Write an equation relating N and P.

$$N = \frac{\quad}{\quad}$$

3 pts

b) Use your answer for (a) to find out how many plates she could sell if she lowered the price to 10 dollars each.

2 pts