

Math 098 Final Exam

Winter 2009 – Form A

200 points + 4 bonus = 204 points

Name: _____

Instructor: _____

1. Solve the following inequality and then graph your solution on the number line.
 $12p + 20 > 10p + 16$

_____ 4pts

<-----> p 1pt

2. Simplify. Write answers with positive exponents.

$(7d^2 - 5d + 4) + (2d^2 + 8d - 12)$ _____ 3pts

$(5r - 3) - (7r^2 - 2r)$ _____ 3pts

$(5 - x^2)(5 + x^2)$ _____ 3pts

$(3y - 2)^2$ _____ 3pts

$6a^5b^2(2ab^4)$ _____ 3pts

$\frac{8x^5yz^2}{4x^2y^{10}z^0}$ _____ 3pts

3. Simplify.

$$\frac{20w^2 - 15w}{-5w} \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

$$\frac{x^2 + 4x - 5}{x - 1} \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

$$\frac{5x + 3}{x(x + 7)} + \frac{4x - 3}{x(x + 7)} \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

4. Factor.

$$x^2 + 3x - 70 \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

$$5w^2 - 7w - 6 \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

$$5b^3 - 50b^2 + 105b \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

$$81 - z^2 \quad \underline{\hspace{2cm}} \quad 4\text{pts}$$

5. Solve.

$$\frac{4}{x + 3} = \frac{5}{x} \quad \underline{\hspace{2cm}} \quad 6\text{pts}$$

6. Solve using **factoring**.

$q^2 - 5q = 24$ _____ 6pts

$9n^2 - 25 = 0$ _____ 6pts

7. Solve using the **quadratic formula**. Approximate answers to 2 decimal places.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$9x^2 - 8x - 3 = 0$

$x =$ _____ or _____ 10pts

8. Write an equivalent expression with exponents: $\sqrt{3x}$. _____ 3pts

9. Simplify.

$\sqrt{180x^6y^3}$ _____ 5pts

$\sqrt{5}(4 - \sqrt{5})$ _____ 5pts

10. Solve for y.

$\sqrt{5y} + 2 = 17$

_____ 5pts

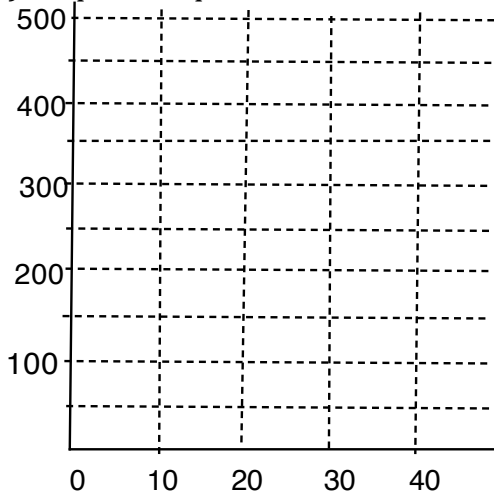
11. The official soccer field size for adults is allowed to vary within a range of acceptable values. This particular soccer field has a length that is 10 yards longer than twice the width and a perimeter of 380 yards. Find the length and the width.

_____6pts

12. A good friend makes you a loan. A is the amount you still owe and x is the number of weeks since they gave you the loan. $A = \frac{-25}{2}x + 500$.

a) Graph the equation.

6pts



b) How much do you still owe your friend after 30 weeks?

_____6pts

c) How many weeks have passed if you now owe \$375?

_____6pts

13. Find the equation of the line that goes through the points $(-6, 15)$ and $(2, 3)$. Put your answer in slope intercept form.

_____10pts

14. Find the slope of the line that is perpendicular to $7y - 3x = 5$.

_____ 5pts

15. A freelance writer was hired to write a solutions manual for a mathematics textbook. She received \$30 for each page that contained only text and \$45 for each page that contained graphics. If her earnings for a 552 page manual were \$18,270, how many pages of text and how many pages of graphics did the manual contain? **Write** a system of equations for this situation. Do **NOT** solve the system

_____ 3pts
1st equation

_____ 3pts
2nd equation

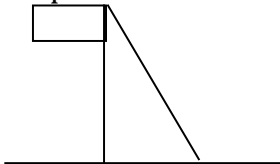
16. Solve the system.

$$x - 3y = 9$$

$$2x + y = 11$$

_____ 6pts

17. You bought a flagpole off the Internet and it was missing the guide wires. The flagpole is 20 ft tall and needs to be attached to the ground 6 feet from the base of the pole. How much wire do you need? Round your answer to 2 decimal places.

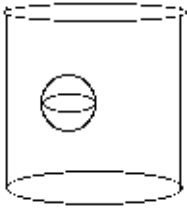


_____ 6pts

18. On a road atlas, 1 inch represents 16.6 miles. If two cities are 3.5 inches apart on the map, how far apart are they in reality?

_____ 6pts

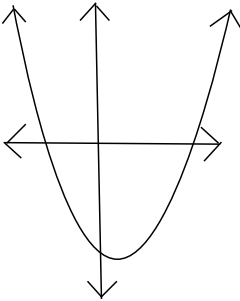
19. An artist creates a sculpture that is a solid clear plastic cylinder that has a solid blue rubber ball suspended in the middle. The cylinder is 10 ft high and has a diameter of 6 ft. The blue ball has a radius of 2 ft. The volume of a sphere is given by $V = \frac{4}{3} \pi r^3$. The volume of a cylinder is given by $V = \pi r^2 h$. How much blue rubber and how much clear plastic does the artist need? Round answers to 2 decimal places.



_____ 4pts
amount of blue rubber

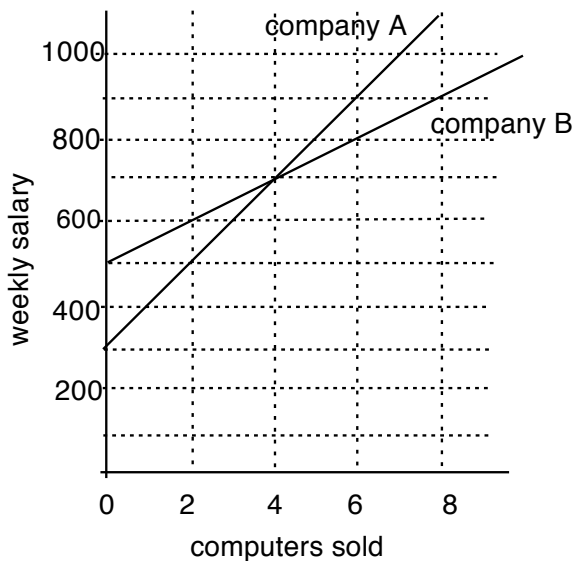
_____ 4pts
amount of clear plastic

20. The graph of $y = x^2 - 3x - 10$ or $y = (x + 2)(x - 5)$ is provided below. Use either form of the quadratic equation to find the coordinates of the vertex, the y-intercept and the x-intercepts.



(_____ , _____) and (_____ , _____) 4pts
x-intercepts

(_____ , _____) 2pts (_____ , _____) 4pts
y-intercept vertex



22. Two computer sales companies have given you job offers. Each is willing to pay you a weekly salary and a commission for each computer you sell. Your total from each company for selling x computers is graphed below.

a) After how many computer sales do the two companies offer the same total earnings?

_____ 3pts

b) If you can sell 6 computers in a week, which would pay more?

_____ 3pts

c) What is the weekly salary offered by company B?

_____ 3pts

d) What is the y-intercept for company B?

(_____ , _____) 3pts

e) Find the slope for line B. Include units.

_____ 5pts
slope units

f) Write a complete, descriptive sentence to explain the meaning of the slope for line B in this situation. Include numbers and units in your explanation. 5pts

Bonus: I own a house in Bellevue. With the downturn of the housing market it has lost 27% of its value and is now worth \$335,800. How much was the house worth before the downturn in housing prices?

_____ 4pts