Math 098 **Name: _____ (Please print)**

Sample Final Exam 1

Instructor: _____ Score: _____ (Instructor)

Show all work. Answers without sufficient work or not placed in the "answer space" may not receive credit. Point-values for each problem are shown at the right in parenthesis.

For problems 1-10 perform the operation. Simplify the answers completely with positive exponents.

1. Subtract: $(15x^2 - 7x + 4) - (9x^2 - 3x + 6)$ 1._____ (3)

2. Divide: $(12m^4n^5 - 8m^3n^3 - 4mn) \div (4m^3n^3)$ 2._____ (3)

3. Multiply: $(\sqrt{y} - \sqrt{5})(\sqrt{y} + \sqrt{5})$ 3._____ (3)

4. Subtract: $\frac{2}{k+4} - \frac{1}{k}$ 4._____ (3)

5. Simplify: $(m^4n^3)^{-2}(m^5n^0)^3$ 5._____ (3)

6. Simplify: $\frac{4a^{-5}b^7}{12b^{-2}a^3}$ 6._____ (3)

7. Divide: $\frac{6}{w-3} \div \frac{36}{3-w}$ 7._____ (3)

8. Simplify: $\frac{x^2-25}{x-5}$ 8._____ (3)

9. Simplify: $\sqrt{50t^{13}}$. Answer in simplified radical form. 9._____ (3)

10. Write the number 396,710 in scientific notation. 10._____ (2)

11. Factor completely.

a) $5r^2 + 12r + 4$ 11a)_____ (2)

b) $ab + 5b + 2a + 10$ 11b)_____ (2)

12. Solve for x: $5^{7-2x} = 25$ 12._____ (3)

13. Solve for t: $\sqrt{6t + 4} = -3$ 13._____ (3)

14. Solve for t by factoring: $t^2 - 2t - 15 = 0$ 14. $t =$ _____or_____ (3)

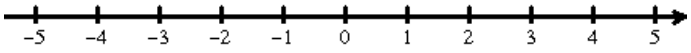
15. Solve $(3k + 2)^2 = 49$ for k by using the Square Root property. 15._____ (3)

16. Solve for A: $n = \frac{2A}{\mathrm{B+d}}$ 16._____ (2)

17. Solve $2x^2 - 3x - 5 = 0$ for x using the quadratic formula, $= \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

17. $x =$ _____or_____ (3)

18. Solve the inequality $-\frac{1}{3}x + 2 \leq 3$ for x. Graph the solution set of the inequality.



18._____ (4)

19. Use the equation $y = x^2 - 4x + 3$ to answer the questions below.

a) Find the coordinates of the x-intercepts.

19a) (_____, _____)

19a) (_____, _____) (3)

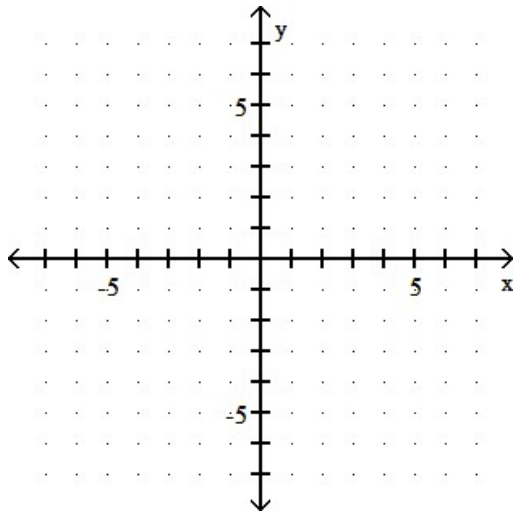
b) Find the coordinates of the y-intercept.

19b) (_____, _____) (1)

c) Find the coordinates of the vertex.

19c) _____ (2)

d) Sketch the graph on the axes provided. (2)



20. Use the equation $4x - 3y = -1$ to answer the questions below.

a) Find the coordinates of the x-intercept.

20a) (_____, _____) (2)

b) Find the coordinates of the y-intercept.

20b) (_____, _____) (2)

c) Write the equation of the line in slope-intercept form.

20c) _____ (2)

21. If the sales tax on a $ 34.00 sweater is $ 2.89, find the sales tax on a $ 98.00 sweater.

21._____ (3)

22. Suppose that x varies inversely as p, and $x = 50$ when $p = 2$ **.** Find x when $p = 25$

22._____ (3)

23. The temperature of the water in a certain lake on a day in October is determined by the formula $T = -\frac{11}{20}\ d + 15.2$, where d is the number of feet below the surface of the lake and T is the temperature in degree Celsius of the water at this depth.

a. What is the slope in this case? (Include units.) _____ (2)

b. In the space below, write a short sentence to explain the meaning of the slope in this case. Use numbers and units in your explanation.

_____ (2)

_____

_____

24. A line passes through the points $(6, -9)$ and $(9, -14)$.

a) Find the slope of the line. 24a) _____ (2)

b) Find the equation of the line in slope-intercept form. 24b) _____ (3)

c) Find the slope of a line that is perpendicular to the line you found.

24c) _____ (1)

25. Solve the following system of linear equations. Write your solution as an ordered pair.

$.6x + .7y = .4$

$5x + 8y = -1$

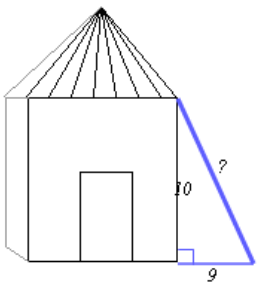
25._____ (4)

26. How many bags of soil worth $70 per bag and fertilizer worth $90 per bag should be mixed to obtain 40 bags of mixture worth $77.50 per bag? Let S be the number of bags of soil and F be the number of bags of fertilizer. Write a system of equations. Do NOT solve the system.

Equation 1: _____ (2)

Equation 2: _____ (2)

27. A ladder leans against the side of a house. The top of the ladder is 10 feet from the ground. The bottom of the ladder is 9 feet from the side of the house. Find the length of the ladder. If necessary, round your answer to the nearest tenth.



27._____ (4)

28. Two cars start from towns 238 miles apart and travel toward each other on the same road. They pass one another 2 hours later. Find the speed of each car if one travels 5 mph slower than the other.

28._____ (4)