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

Sample Final Exam 2

Instructor: _____ Score: _____

Show your work to receive full credit

1. Subtract: $(3x^2 - 2x + 6) - 3(4x^2 - 5x + 3)$

1._____(3)

2. Simplify: $(k^2n^4)^{-3}(k^7n^0)^2$. Write your answer using positive exponents only.

2._____(3)

3. Multiply: $(\sqrt{y} - 2)(\sqrt{y} + 2)$

3._____(2)

4. Subtract: $\frac{3}{14R} - \frac{1}{7R^2}$

4._____(3)

5. Simplify: $\frac{y^2+2y-15}{y+5}$

5._____(3)

6. Simplify the radical $\sqrt{75x^{12}y^5}$. Write your answer in radical form.

6._____(3)

7. Multiply: $(7.3 \text{ x } 10^4)$ by $(4.6 \text{ x } 10^2)$. Write your answer in scientific notation.

7._____(3)

8. Solve the equation for x: $5x^2 = 20$

8. $x =$_____(2)

9. Solve the equation for x: $3(6-2x) = -4x$

9. $x =$ _____ (2)

10. Divide: $\frac{8}{w-5} \div \frac{24}{5-w}$

10. _____ (3)

11. Factor completely. $3x^2 + 6x - 9$

11. _____ (3)

12. Factor completely. $9x^2 - 4y^4$

12. _____ (3)

13. Solve the equation for x: $\sqrt{5x-6} = \sqrt{x}$
Write your answer as a simplified fraction.

13. $x =$ _____ (3)

14. Solve the equation for x: $4x^2 - 16x = 0$

14. $x =$ _____ $x =$ _____ (3)

15. Solve the equation for x: $\frac{x}{3} - 5 = \frac{x}{4} - 2$

15. _____ (3)

16. Solve the equation for x: $2^{2-6x} = 64$
Write your answer as a simplified fraction.

16. $x =$ _____ (3)

17. Suppose y varies directly as x, and $y = 36$ when $x = 4$.

a) Circle the variation model for this situation. Use k as the constant of the variation.

$$x = \frac{k}{y} \qquad y = \frac{k}{x} \qquad y = kx \qquad x = ky \qquad (1)$$

b) Solve for the constant of variation.

17b) $k =$ _____ (1)

c) Find the value of x when y is 108.

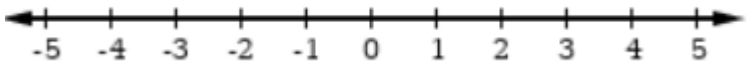
17c) $x =$ _____ (1)

18. Consider the inequality $-(3 + 8x) \leq 21$

a) Solve the inequality for x.

18a) _____ (2)

b) Graph your solution on the number line.



(2)

19. To make 12 small cakes, I need 180 grams of sugar. How many grams of sugar will I need to make 33 small cakes?

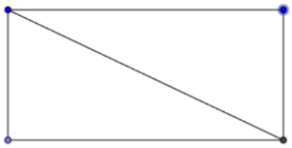
19. _____ grams (3)

20. A rectangular picture has a perimeter of 110 inches. The length is 5 inches less than three times the width. Find the length and the width of the picture frame. Include units in your answers. (4)

Length_____ _____
number units

Width _____ _____
number units

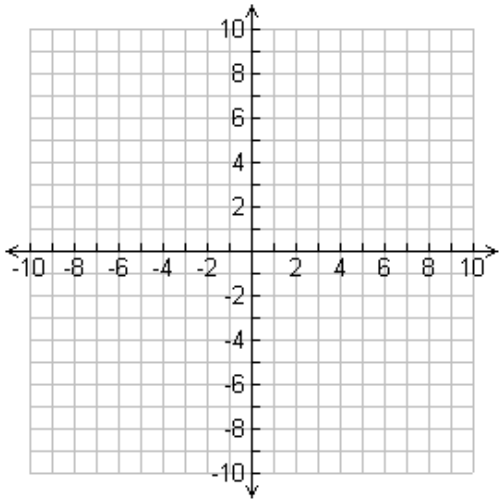
21. A rectangle is 42 meters wide and 56 meters long. What is the length of the diagonal?



21._____ meters (4)

22. Use the equation $y = x^2 + 2x - 8$ to:

a) Find the $x-$ intercepts. Write your answers as ordered pairs.



(____, ____) and (____, ____) (3)

b) Find the $y-$ intercept. Write your answer as an ordered pair.

(____, ____) (2)

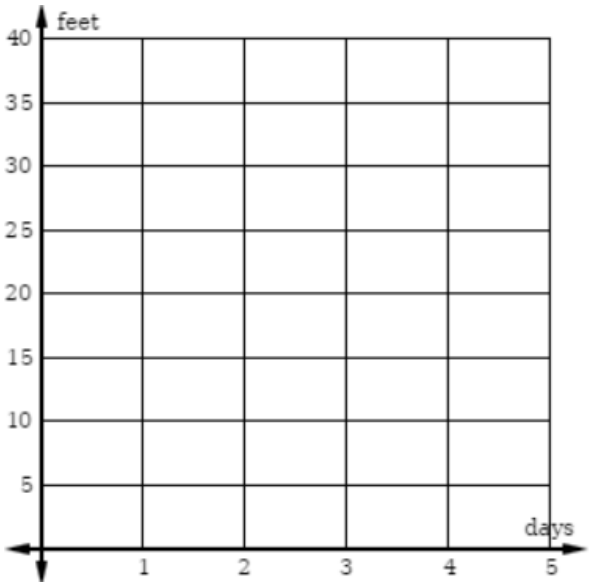
c) Find the vertex. Write your answer as an ordered pair.

(____, ____) (2)

d) Using your answers from above, draw a graph of the parabola. (2)

23. The equation: $F = -\frac{5}{2}d + 30$ gives the water level of the river (F in feet) after d days.

a) Graph the equation. (2)



b) After how many days will the water level be 15 feet?

b) _____ _____ (3)
number units

c) What does the slope represent in the context of this problem? Use a complete sentence, including numbers and units.

_____

_____ (3)

24. Solve the following system of linear equations algebraically. Show work for full credit. Write your answer as an ordered pair.

$$6x + 5y = 2$$
$$-8x - 10y = 24$$

24.(_____, _____) (3)

25. Donovan took a math test and got 40 correct and 10 incorrect answers. What was the percentage of correct answers?

25._____ (2)

26. Use the quadratic formula $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ to solve the equation

$2x^2 - 11x + 10 = 0$ for x. Round your answers to the nearest hundredth.

26. $x =$ _____ $x =$ _____ (4)

27. A line goes through $(-3, 4)$ and $(5, 28)$.

a) Find the equation of the line. Write your answer in slope intercept form.

27a) _____ (3)

b) Find the slope of the line that is **perpendicular** to the one described above.

27b) _____ (2)

28. In the formula: $P = 2l + 2w$, solve for w.

28. _____ (2)

29. How many liters of a 20% antifreeze solution should be added to 60 liters of a 70% antifreeze solution to make a 50% antifreeze solution? Write a system of equations to solve this. **You do not need to solve the system.**

Equation 1 _____ (2)

Equation 2 _____ (2)