

Name: _____

Please show your work.

1. Let $A = \left\{ -6, -\frac{12}{4}, -\frac{5}{8}, -\sqrt{3}, 0, \frac{1}{4}, 1, 2\pi, 3, \sqrt{12} \right\}$. List all the elements of A that belong to each set.

a) Natural numbers:

b) Whole numbers:

c) Integers:

d) Rational numbers:

e) Irrational numbers:

f) Real numbers:

2. Divide:

$$\frac{-8r^3s - 12r^2s^2 + 20rs^3}{-4rs}$$

3. Divide:

$$\frac{x^4 - 4x^2s^2 + 2x + 5}{x^2 + 1}$$

4. Write in radical form: $(2x + 3)^{2/3}$

5. Write in exponential form: $\sqrt[4]{v^7}$

Simplify #s 6 – 8. Assume all variables represent positive real numbers.

6. $\sqrt{8x^5y^8}$

7. $\sqrt[3]{\frac{16x^3y^8}{9r^{12}}}$

8. $\sqrt[4]{81x^6y^3} - \sqrt[4]{16x^{10}y^3}$

9. Rationalize the denominator:

$$\frac{1 + \sqrt{3}}{3\sqrt{5} + 2\sqrt{3}}$$

#s 10 – 13 – Solve for x:

10. $(2x - 3)^2 = (2x + 5)^2$

11. $\frac{1}{3}x + 6 = \frac{5}{6}x - 4$

12. $2(3x + 5) = 6 - 4(x - 8)$

13. $7(2x - 3) + 6 = 12x - 15 + 2x$

14. Solve for F.

$$C = \frac{5}{9}(F - 32)$$

15. If you borrow \$100 and pay back \$105 at the end of one month, then what is the simple annual interest rate?

16. To be able to afford the house of their dreams, Dave and Leslie must clear \$128,000 from the sale of their first house. If they must pay \$780 in closing costs and 6% of the selling price for the sales commission, then what is the minimum selling price for which they will get \$128,000?

17. A pharmacist needs to obtain a 70% alcohol solution. How many ounces of a 30% alcohol solution must be mixed with 40 ounces of an 80% alcohol solution to obtain a 70% alcohol solution?

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- 18.** Joe rowed his kayak from his camp on the bayou to his crab traps. Going down the bayou, he caught a falling tide that increased his normal speed by 2 mph. The return trip, against the tide, decreased his normal speed by 2 mph. Going with the tide, the trip only took 10 min; going against the tide, the trip took 30 min. How far is it from his camp to his crab traps?

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- 19.** Find the distance between $(-4, 3)$ and $(-7, -5)$.

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- 20.** Find the midpoint of the line connecting $(7, 6)$ and $(-3, -4)$.
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21. Find the x and y intercepts of the line $4x - 6y = 48$.

22. Write the equation of a line that goes through the points $(2, 4)$ and $(7, -3)$.

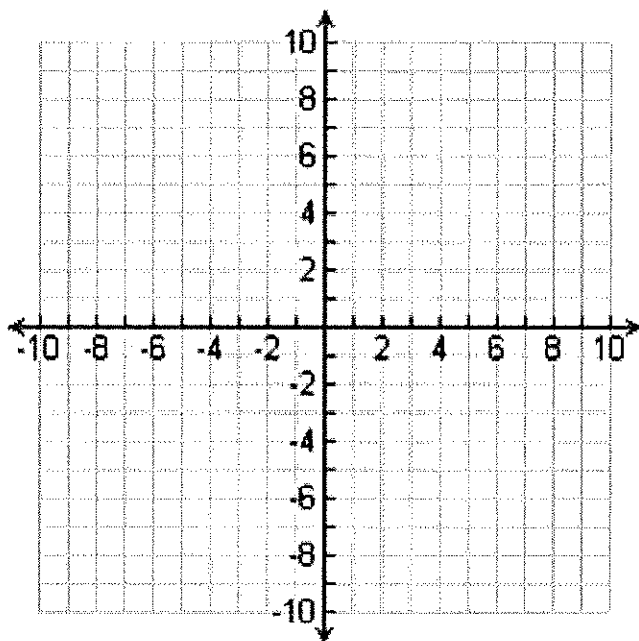
23. a) Write the equation of a vertical line.

b) Write the equation of a horizontal line.

24. Write the equation of a line perpendicular to the line $3x - 4y = 24$.

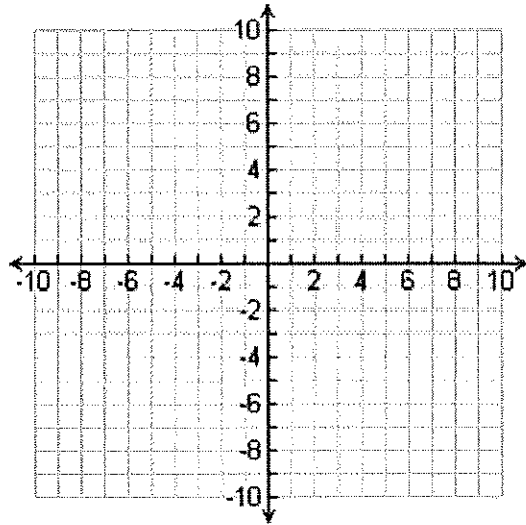
25. Write the equation of a line through $(4, -2)$ that is parallel to $3x + 5y = 10$.

26. Graph the line $y = -\frac{2}{3}x + 5$.



Use the following information for problems 27-30:

27. Draw triangle ABC with
 $A(-1, 4)$, $B(7, -2)$, and $C(-5, -6)$.



28. The median from vertex A joins A to the midpoint of the opposite side, a point D on \overline{CB} . Find the equation of the line passing through A and D.

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29. If \overline{AE} is the altitude from point A to \overline{CB} , find the equation of the line passing through A and E.

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30. Find the equation of the perpendicular bisector of \overline{AC}
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