

Solve each problem. 5 points for each problem. Show all work for full credit.

1. Solve the inequality, graph the solution and write the solution in interval notation.

$$-3(x + 2) > -9$$

2. Solve the inequality, graph the solution and write the solution in interval notation.

$$-4 \leq \frac{x + 2}{3} \leq 4$$

3. Solve. $\left| \frac{1}{2}x - 3 \right| - 4 = 2$

4. Solve the inequality, graph the inequality, and write the solution set in interval notation.

$$|2x + 7| < 13$$

5. Solve the inequality, graph the inequality, and write the solution set in interval notation.

$$|2x - 3| \geq 3$$

6. Factor $x^2 + 4x + 4 - 9y^2$.

7. Factor $x^3 + 64y^3$.

8. Graph on the rectangular coordinate system $x = -2$.

9. Use synthetic division to do the division.

$(2x^3 + 4x^2 + 3x - 1) \div (x + 2)$ **Remainder:** _____ , **Quotient:** _____

10. Find the slope of the line that passes through the points: $(2, -4)$ and $(6, 4)$.

11. Find the slope of the line $y = -4$.

12. Find the slope of the line that is perpendicular to the graph of $y = -\frac{3}{4}x - \frac{1}{4}$.

13. Determine whether the two lines $4x + 8y = 10$ and $2x = 12 - 4y$ are perpendicular, parallel, or neither.

14. Find the equation of the line that passes through the point $(2, 3)$ with a slope of -2 .

15. Solve : $|4x - 3| = |2x + 5|$.

16. Find the equation of the line that passes through the point $(-6, -1)$ perpendicular to $2x + y = 8$.

17. (a) Rewrite the equation of $2x + 3y = 6$ in slope-intercept form .

(b) Find the slope and the y-intercept of the equation $2x + 3y = 6$.

(c) Graph $2x + 3y = 6$.

18. Find the equation of the vertical line that passes through the point $(2, -1)$.

19. Solve the inequality : $|2x - 1| + 2 < 2$.

20. Use the **Factor Theorem** and determine whether the first expression is a factor of $P(x)$ or not.

$$x + 1 \quad ; \quad P(x) = x^3 + 2x^2 - 2x - 3$$