

Math 171
Systems of Equations and Inequalities

Solve:

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

2. $3x - 2y = 11$
 $2x + 3y = -5$

3. With the current, a boat can be rowed 24 miles in 3 hours. Against the current, a boat can be rowed $\frac{3}{4}$ of the distance in 4 hours. Find the velocity that the boat can be rowed in still water.

4. $2x + 4y - z = 2$
 $3x - y + 2z = 4$
 $x + y + z = -5$

5. $x + y = 3$
 $x + z = 3$
 $y + z = 3$

Write the partial fraction decomposition of the given fraction:

6. $\frac{4x + 3}{x(x+2)(x-3)}$

7. $\frac{3x^3 - 6x^2 + 7x - 2}{(x^2 - 2x + 2)^2}$

Solve:

8. $x^2 + y^2 - 4x - 6y - 4 = 0$
 $x^2 - y^2 - 4x + 6y + 10 = 0$

9. $x^3 + x - y + 2 = 0$
 $x + y - 1 = 0$

10. A planet's orbit follows the equation given by $P(x)$ and a comet follows an orbit given by the equation $C(x)$. Locate the collision point.

$P(x) : 16x^2 + 4y^2 = 64$
 $C(x) : x^2 - y = -4$

Graph the inequalities:

11. $y \leq 2x + 1$

12. $x^2 + y^2 + y > 5$

13. $2x + y \geq 4$
 $x - 2y < -2$

14. $3x < y$
 $2x + y + -4 \leq -1$
 $x > 2$
 $y < 8$