

Math 110 Review

Instructions: Focus on the subjects where you feel weakest. I encourage you to work with others.

Linear equations and inequalities, one variable:

1. Solve each equation.

(a) $\frac{2x - 5}{4} - \frac{3x - 1}{6} = -\frac{13}{12}$

(c) $\frac{1}{2} \left(y - \frac{1}{6} \right) + \frac{2}{3} = \frac{5}{6} + \frac{1}{3} \left(\frac{1}{2} - 3y \right)$

(b) $\frac{x - 1}{2} - \frac{3x - 1}{6} = \frac{1}{3}$

(d) $-\frac{5}{7}x - 1 = 3$

2. Solve for x .

(a) $\frac{1}{x} + \frac{1}{2} = w$

(b) $5x + c = 5$

3. Solve each inequality. Give the solution set both graphically and using interval notation.

(a) $3(x + 2) > 5(x - 1)$

(d) $-2 \leq \frac{2x - 3}{10} < 1$

(b) $\frac{1}{2}x + 7 \leq \frac{3}{4}x - 5$

(e) $0.5x < 2$ and $-0.6x < -3$

(c) $-\frac{1}{2}x < 6$ or $\frac{2}{3}x < 4$

(f) $x - 3 > 7$ or $3 - x > 2$

Word Problems: Solve each word problem. You may use either one variable and one equation, or two variables and two equations to set up the problem.

- (a) You're mixing 5 pounds of dried cranberries that sell for \$4 per pound with some almonds that sell for \$12 per pound. You want the resulting mix to be worth \$10 per pound; how many pounds of almonds should you use?
- (b) The width of a rectangle is 75% of its length. If the perimeter is 7 meters, what are the length and width?
- (c) The sum of two numbers is 5 and their difference is 30. Find the numbers.
- (d) On a long bike trip, you ride for 5 hours. You then get a flat, and walk 3 hours to the next town. Altogether, you've covered 85 miles. If you rode 9 mph faster than you walked, how far did you walk?

Linear equations in two variables

4. Write the equation of each line in (i) slope-intercept form and (ii) standard form with integral coefficients.

- (a) The line with x -intercept $(3, 0)$ and y -intercept $(0, -7)$.
 (b) The line through $(-3, 2)$ with slope $-\frac{2}{3}$.
 (c) The line through $(3, -2)$ perpendicular to $y = -3x + 1$.
 (d) The line through $(-1, 4)$ parallel to $y = -x + 7$.
 (e) The line through $(2, -6)$ and $(2, 5)$.
 (f) The line through $(-3, 6)$ and $(4, 2)$.

5. Graph each equation.

- (a) $5x - 3y = 7$
 (b) $y - 3 = 10$
 (c) $7x = 21$
 (d) $4x + 5y = 10$

6. Graph the solution set to each linear inequality.

- (a) $y > 3x - 2$
 (b) $y \leq 2x + 3$
 (c) $-5x > 3$
 (d) $3y > 9$ and $y - x \leq 5$
 (e) $3x + 2y \geq 8$ or $3x - 2y < 6$
 (f) $1 \leq x < 3$ and $2 < y \leq 5$

7. Set $f(x) = -x + 1$ and $g(x) = -x^2 + x - 6$. Compute each of the following.

- (a) $f(0)$
 (b) $g(0)$
 (c) $f(-3)$
 (d) $g(-3)$
 (e) $g(\frac{1}{2})$
 (f) $g(-\frac{1}{2})$

8. State the domain and range of $y = \sqrt{x + 5}$.

9. Solve each system of equations by graphing. State the solution set, and say whether each system is dependent, independent, or inconsistent.

- (a) $x + 2y = 4$
 $y = -\frac{1}{2}x + 2$
 (b) $x = y + 5$
 $2x - 2y = 12$

10. Solve each system of equations algebraically, using either the addition method, the substitution method, or Gauss-Jordan elimination. State the solution set, and say whether the system is dependent, independent, or inconsistent.

- (a) $y = 3x + 11$
 $2x + 3y = 0$
 (b) $x - y = 3$
 $3x - 2y = 3$
 (c) $5x - 3y = -20$
 $3x + 2y = 7$
 (d) $2(y - 5) + 4 = 3(x - 6)$
 $3x - 2y = 12$
 (e) $x = y + 5$
 $2x - 2y = 7$
 (f) $\frac{1}{4}x + \frac{3}{8}y = \frac{3}{8}$
 $\frac{5}{2}x - 6y = 7$