

Review of Systems of Equations and Graphs

Please do exercises and graphs on separate sheets of paper and staple to this page.

1. Two Equations, Two Unknowns.

Solve each system of equations for the indicated variables. Simplify your results.

- a. Solve for x and y : (1) $3x + 2y = 6$ (2) $3x - 2y = 18$
- b. Solve for T_1 and T_2 : (1) $0.60 T_2 - 0.80 T_1 = 0$ (2) $0.60 T_1 + 0.80 T_2 = 100$
- c. Solve for a and T : (1) $T - \mu mg = ma$ (2) $Mg - T = Ma$
- d. Solve for t and x : (1) $x = v_0 t$ (2) $y = \frac{1}{2} g t^2$

2. Systems of Equations.

Solve each system of equations for the indicated variables. Simplify your results.

- a. Solve for a , N , and T : (1) $F \cos\beta - \mu N - T = m_1 a$
 (2) $N + F \sin\beta - m_1 g = 0$
 (3) $T - m_2 g = m_2 a$
- b. i. Solve for v_0 and V : (1) $m v_0 = (m + M)V$
 (2) $\frac{1}{2} (m + M)V^2 = (m + M)gh$
- ii. Find values for v_0 and V if $h = 0.05$ m, $m = 0.005$ kg, $M = 1.0$ kg and $g = 9.8$ m/s²
- c. Solve for R_x , R_y , and T : (1) $R_x - 0.80 T = 0$
 (2) $R_y - 0.60 T - 800 = 0$
 (3) $4.8 T - 2000 = 0$
- d. Solve for v_{1f} and v_{2f} : (1) $m_1 v_{1i} = m_1 v_{1f} + m_2 v_{2f}$
 (2) $\frac{1}{2} m_1 v_{1i}^2 = \frac{1}{2} m_1 v_{1f}^2 + \frac{1}{2} m_2 v_{2f}^2$

This is a challenging problem.

3. Graphing Functions.

Graph each of the given functions. These graphs can all be done on one sheet of graph paper. Use one-fourth of the page for each graph. Clearly label axes and scales used.

a. $y = 3x - 2$

b. $y = -3x + 2$

c. $2x - 3y = 6$

d. $x = 3t - 5$

4. Finding Slopes of Lines.

a. Find the slope of the line that passes through the points (4, 5) and (-2, 6).

b. Find the slope of the line that passes through the points (4, 5) and (4, 16).

5. Writing Equations for Lines.

a. Write an equation for the line that passes through the points (2, 3) and (3, 2).

b. Write an equation for the line with a slope of -3 and a y-intercept of 7.

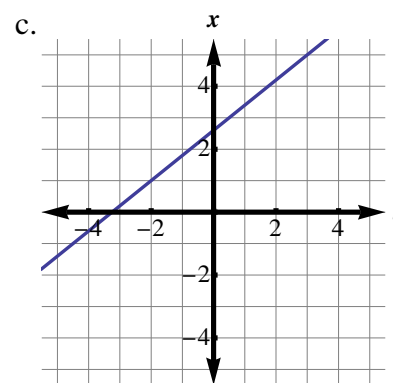
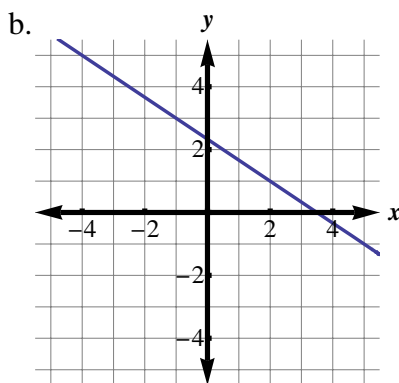
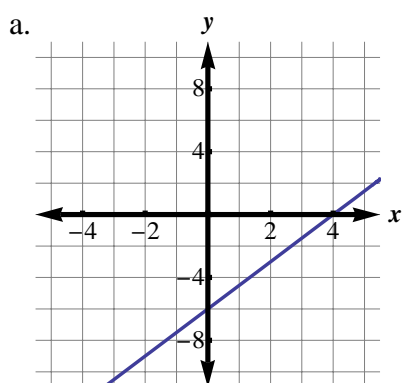
c. Write an equation for the line with a slope of 5 that passes through the point (-2, 5).

6. Finding Slopes and Intercepts of Lines from Equations.

a. Find the slope and the y-intercept of the line whose equation is $x + y = 6$.b. Find the x-intercept and the y-intercept of the line whose equation is $4x + 3y = 12$.c. Find the slope and the y-intercept of the line whose equation is $6x + 2y = 3$.

7. Finding Slopes and Equations from Graphs.

For each of the following graphs find the slope of the line and an equation for the line.



8. Graphing Data and Interpreting the Results.

Given the following data, graph the data points and draw the curve that best fits the data (remember, a straight line is mathematically a curve). If the graph is a straight line, calculate the slope of the line and write an equation for the line. Both graphs may be drawn on the same set of axes. Use a different color for each graph and clearly indicate which graph goes with each set of data.

a.

<u>time (s)</u>	<u>position (m)</u>
0.00	0.0
1.00	1.0
2.00	3.9
3.00	9.1
4.00	15.9
5.00	25.2
6.00	36.1
7.00	48.9
8.00	64.0
9.00	82.0
10.00	99.5

b.

<u>time (s)</u>	<u>position (m)</u>
0.00	5.5
1.00	13.2
2.00	21.6
3.00	29.2
4.00	37.6
5.00	44.9
6.00	53.7
7.00	61.5
8.00	69.3
9.00	77.8
10.00	85.4

The two data sets are given for a block sliding along a smooth horizontal surface and a block sliding down a smooth inclined ramp. Which set of data represents which block?