Chapter 7 Practice Test
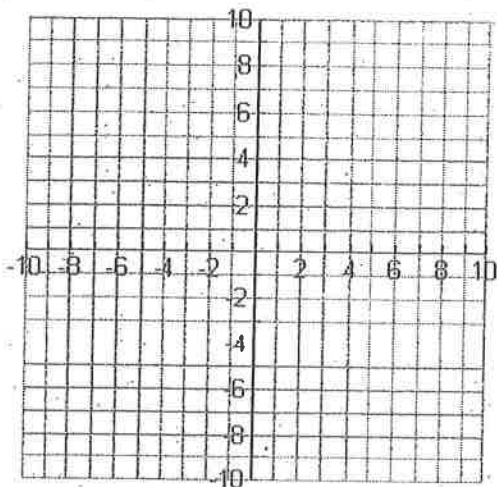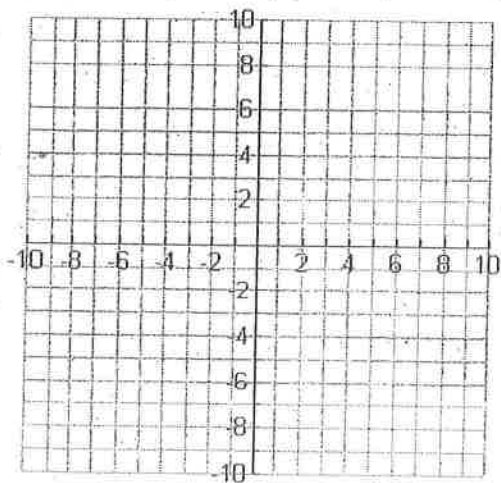
*If you need more practice with substitution or elimination try the crossed out questions

1. Solve each system of linear equations graphically.

   a) $y = 3x + 1$

   $y = \dfrac{-1}{2}x + 8$

   b) $2x + y - 5 = 0$

   $x - y + 2 = 0$

2. Solve the following systems of linear equations by **substitution**. Verify your answers.

   a) ~~$2x - 3y + 17 = 0$~~
   ~~$y = -5x$~~

   b) $4x + y = 1$
   $x = 2y - 20$

3. Solve the following systems of linear equations by **substitution**.

   a) ~~$x + y = 9$~~
   $-10x + 6y = 6$

   b) $x - 3y = 4$
   $5x - 7y = 4$

4. Solve using **elimination**.

   a) $x + y = 4$
   $x - y = 10$

   b) ~~$4x - 5y = -28$~~
   ~~$4x - y = 4$~~

5. Solve using **elimination**.

   a) $5 = 6x + 2y$
   $2y = x + 5$

   b) $y + 6 = x$
   $y = -3x + 2$

6. Predict the number of solutions for each system of linear equations. Justify your answers.

   a) $y = 5x - 1$
   $y = -2x - 1$

   b) $y = \dfrac{1}{2}x + 5$

   $y = \dfrac{1}{2}x + 5$

   c) $y = 4x - 1$
   $y = 4x + 3$

7. How many solutions does each linear system have? Justify your answers.

   a) $2x + 3y = 20$
   $6x - y = 20$

   b) $x - 5y = 1$
   $-x + 5y = 1$

   c) $x + 3y = 5$
   $2x + 6y = 10$

Name: _____   Date: _____

8. The perimeter of a rectangle is 48 cm. The width is one third the length. Determine the dimensions of the rectangle.

9. A number is 12 less than one third of another number. Their sum is 56. What are the numbers?

10. A motorboat travels 4 km downstream in 0.5 h, and travels the same distance upstream in 2 h. Determine the speed of the boat in still water.

11. Max invested $15 000 in two different funds. One earned 6% interest in the first year and the other earned 8%, for a total of $1100 in interest. Determine how much he invested in each fund.

Answers:

1. a) (2, 7) b) (1, 3)

2. a) $x = -1$ and $y = 5$ b) $x = -2$ and $y = 9$

3. a) $x = 3$ and $y = 6$ b) $x = -2$ and $y = -2$

4. a) $x = 7$ and $y = -3$ b) $x = 3$ and $y = 8$

5. a) $x = 0$ and $y = \frac{5}{2}$ b) $x = 2$ and $y = -4$

6. a) One solution. The equations have different slopes.
b) Infinite number of solutions. Both equations have the same slope and y-intercept.
c) No solution. The equations have the same slope and different y-intercepts.

7. a) One solution. The equations have different slopes.
b) No solution. The equations have the same slope and different y-intercepts.
c) Infinite number of solutions. Both equations have the same slope and y-intercept.

8. 6 cm by 18 cm

9. 5 and 51

10. 5 km/h

11. $5000 at 6% and $10 000 at 8%