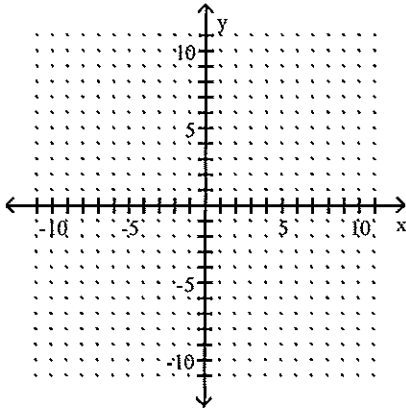Chapter 6 pRactice teot2

Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the solution set of the system by graphing the equations by hand. If the system is inconsistent or dependent, say so.

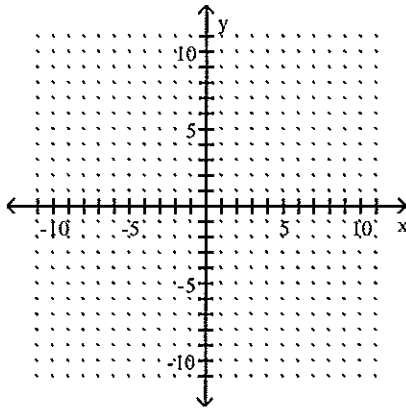1) $5x + 4y = -16$ 1) _____

$y = -\dfrac{5}{4}x - 8$

A) $(0, -8)$
B) $(-5, 4)$
C) all points on the line $5x + 4y = -16$; dependent system
D) empty set; inconsistent system

2) $x + y = -8$ 2) _____
$x - 3y = 16$

A) $(-2, 6)$ B) $(-6, 2)$ C) $(-6, -2)$ D) $(-2, -6)$

Solve the problem.

3) The table below lists women's and men's total enrollments at all institutions of higher learning in   3) _____
   Country X for various years.

College Enrollments (Millions)

Year	Women	Men
1988	6.3	5.9
1990	7.4	6.5
1994	8.1	6.8
2002	8.9	7.1
2006	9.2	7.4

The enrollments (in millions) of women and men, respectively, can be modeled by the system
$W(t) = 0.14t + 5.69$
$M(t) = 0.07t + 5.62$
where t is the number of years since 1980.

(i) Use "intersect" on a graphing calculator to estimate when women's and men's enrollments were
approximately equal. What was that enrollment?
(ii) Use the models to predict the total enrollment of women and men in 2018.

   A) (i) Intersect at approximately (-2.20, 5.98). This means that in 1978, women's and men's
      enrollment was about 6.0 million students.
      (ii) Not enough information has been provided.
   B) (i) The functions do not intersect.
      (ii) In 2018, W(34) = 10.45 million students and M(34) = 8 million students.
   C) (i) Intersect at approximately (-1.00, 5.55). This means that in 1979, women's and men's
      enrollment was about 5.6 million students.
      (ii) In 2018, W(38) = 11.01 million students and M(38) = 8.28 million students.
   D) (i) Intersect at approximately (-1.11, 6.32). This means that in 1979, women's and men's
      enrollment was about 6.3 million students.
      (ii) In 2018, W(40) = 11.29 million students and M(40) = 8.42 million students.

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

4) Some values of y = 2x − 21 and y = −7x + 24 are listed in the table below.   4) _____

x	0	1	2	3	4	5	6	7	8
y = 2x − 21	−21	−19	−17	−15	−13	−11	−9	−7	−5
y = −7x + 24	24	17	10	3	−4	−11	−18	−25	−32

Use the table to solve the system:
   y = 2x − 21
   y = −7x + 24

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the system by substitution. If the system is inconsistent or dependent, say so.

5) 2x + 4y = −4
      x = −4y   5) _____

   A) (−4, −1)   B) (−4, 1)   C) (1, −4)   D) (4, 1)

6) $x - 3y = 8$
   $2x - 4y = 6$
   - A) $(-8, -4)$
   - B) $(-7, -5)$
   - C) $(7, -4)$
   - D) empty set solution; inconsistent system

6) _____

7) $-3x - 12y = 2$
   $2x + 8y = 0$
   - A) infinite number of solutions of the equation $-3x - 12y = 2$; dependent system
   - B) $(8, 1)$
   - C) $(0, -3)$
   - D) empty set solution; inconsistent system

7) _____

Use substitution to solve the system, with coordinates of solutions rounded to the second decimal place. Verify your work by using "intersect" on a graphing calculator.

8) $y = 5.63x + 3.03$
   $y = -0.72x - 6.91$
   - A) $(-2.63, -5.21)$
   - B) $(-1.36, -7.32)$
   - C) $(-0.83, -4.25)$
   - D) $(-1.57, -5.78)$

8) _____

Solve the system by elimination. If the system is inconsistent or dependent, say so.

9) $x + y = -1$
   $x - y = 7$
   - A) $(-3, -3)$
   - B) $(3, -4)$
   - C) $(2, -3)$
   - D) empty set solution; inconsistent system

9) _____

10) $2x + 10y = -56$
    $8x + 2y = 42$
    - A) $(-2, 7)$
    - B) $(8, -8)$
    - C) $(7, -7)$
    - D) $(-7, 7)$

10) _____

11) $3x - \dfrac{5}{3}y = -11$

    $2x - \dfrac{1}{2}y = -11$

    - A) $(-7, -6)$
    - B) $(-6, -7)$
    - C) $(7, -7)$
    - D) empty set solution; inconsistent system

11) _____

12) $4x - 3y = 9$
    $-8x + 6y = -36$
    - A) $\left(\dfrac{4}{27}, -\dfrac{1}{9} \right)$
    - B) $(2, 4)$
    - C) infinite number of solutions of the equation $4x - 3y = 9$; dependent system
    - D) empty set solution; inconsistent system

12) _____

Solve the system by either elimination or substitution. Verify your work by using "intersect" on your graphing calculator of by checking that your result satisfies both equations of the system.

13) $\frac{1}{5}x - \frac{1}{4}y = 3$

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

13) _____

        A) empty set solution; inconsistent system   B) $\left(\frac{35}{4}, -5\right)$

        C) $\left(5, \frac{1}{4}\right)$ D) $\left(-\frac{35}{4}, -6\right)$

14) $5(2x + 3) - y = -1$
    $7x - 5(y - 3) = -22$

14) _____

    A) $(-6, 1)$ B) $(-1, 6)$ C) $(6, -1)$ D) $(1, 6)$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the problem.

15) Since 1984, mini-van sales have been on the rise, while station wagon sales have decreased. Let M(t) represent the number (in millions) of mini-vans sold during the year that is t years since 1980. Let S(t) represent the number (in millions) of station wagons sold during the year that is t years since 1980. The equations for M and S are given below.

$$M(t) = 0.12t - 0.22 \qquad \text{mini-vans}$$
$$S(t) = -0.10t + 1.43 \qquad \text{station wagons}$$

15) _____

    i)   What are the slopes of M and S? What do they mean in terms of car sales?
    ii) Estimate in which year the same number of mini-vans were sold as station wagons.
    How many were sold of each?

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

16) A couple have bought a new house and are comparing quotes from two moving companies for moving their furniture. Company A charges $110 for the truck and $55 per hour for the movers. Company B charges $100 for the truck and $60 per hour for the movers. Create a cost equation for each company where y is the total cost and x is the number of hours of labor. Write a system of equations.

16) _____

    A) $y = 110x + 55$ B) $55y = x + 110$ C) $55y = 110x$ D) $y = 55x + 110$
       $y = 100x + 60$ $60y = x + 100$ $60y = 100x$ $y = 60x + 100$

17) The number of households in Country X with personal computers (PCs) and the total number of households in Country X are shown in the table below for various years.

Households with Personal Computers (Millions)

Year	Households with PCs	Total Households
1993	28.21	95.5
1997	30.45	98.0
1999	49.80	100.5
2003	59.82	102.2
2005	67.42	114.0

Let C(t) be the number (in millions) of households in Country X with PCs and H(t) be the total number (in millions) of households in Country X, both at t years since 1990.

(i) Find equations for C(t) and H(t) to model the data.
(ii) Use substitution or elimination to predict when all households in Country X will have PCs.
(iii) Use the models to predict the percentage of households that will have PCs in 2015.
  A) (i) $C(t) = 3.50t + 14.22$; $H(t) = 1.31t + 89.70$;
      (ii) In about 2024, all households in Country X will have PCs.
      (iii) In 2015, about 83.1% of households will have PCs.
  B) (i) $C(t) = 4.81t + 16.01$; $H(t) = 0.99t + 68.42$;
      (ii) In about 2029, all households in Country X will have PCs.
      (iii) In 2015, about 77.0% of households will have PCs.
  C) (i) $C(t) = 5.53t + 12.86$; $H(t) = 2.53t + 79.41$;
      (ii) In about 2030, all households in Country X will have PCs.
      (iii) In 2015, about 86.9% of households will have PCs.
  D) (i) $C(t) = 3.67t + 9.63$; $H(t) = 4.30t + 52.37$;
      (ii) In about 2019, all households in Country X will have PCs.
      (iii) In 2015, about 79.0% of households will have PCs.

18) The perimeter of a rectangle is 30 cm. One side is 11 cm longer than the other side. Find the lengths of the sides.
      A) 2 cm, 11 cm   B) 10 cm, 21 cm   C) 2 cm, 13 cm   D) 4 cm, 15 cm

19) A vendor sells hot dogs and bags of potato chips. A customer buys 2 hot dogs and 4 bags of potato chips for $10.50. Another customer buys 4 hot dogs and 5 bags of potato chips for $16.50. Find the cost of each item.
      A) $2.25 for a hot dog; $1.50 for a bag of potato chips
      B) $2.25 for a hot dog; $1.75 for a bag of potato chips
      C) $2.50 for a hot dog; $1.75 for a bag of potato chips
      D) $1.50 for a hot dog; $2.25 for a bag of potato chips

20) A person plans to invest $10,000 in a CD at 6% annual interest and in a mutual fund that has a 3-year average annual interest of 11%. Let x and y represent the money (in dollars) invested in the CD and the mutual fund, respectively. How much money should be invested in each account to earn a total of $700 in one year?
      A) $8000 invested at 6%; $2000 invested at 11%
      B) $9000 invested at 6%; $1000 invested at 11%
      C) $7000 invested at 6%; $3000 invested at 11%
      D) $2000 invested at 6%; $8000 invested at 11%

21) Dmitri needs 5 liters of a 7% solution of sulfuric acid for a research project in molecular biology. He   21) _____
has two supplies of sulfuric acid solution: one is an unlimited supply of the 5% solution and the
other an unlimited supply of the 10% solution. How many liters of each solution should Dmitri
use?

   A) 5% solution: 3.5 L; 10% solution: 1.5 L   B) 5% solution: 3 L; 10% solution: 2 L
   C) 5% solution: 2 L; 10% solution: 3 L   D) 5% solution: 2.5 L; 10% solution: 2.5 L

22) Anne and Nancy use a metal alloy that is 22.2% copper to make jewelry. How many ounces of an   22) _____
alloy that is 18% copper must be mixed with an alloy that is 25% copper to form 60 ounces of the
desired alloy?

   A) 36 oz   B) 24 oz   C) 26 oz   D) 41 oz

6

1) D
2) D
3) C
4) (5, –11)
5) B
6) B
7) D
8) D
9) B
10) C
11) A
12) D
13) B
14) B
15) i)   The slopes of M and S are 0.12 and –0.10, respectively. This means that mini-van sales are increasing by 120 thousand cars per year and station wagon sales are decreasing by 100 thousand cars per year.
    ii) In 1988, the sales for mini-vans and station wagons were both 680,000.
16) D
17) A
18) C
19) A
20) A
21) B
22) B