Chapter 3 & 8.1 – 8.3

These are meant for practice. The actual test is different.

**Determine whether the pair of equations represents parallel lines.**

1) \(9x + 3y = 12\)
   \(27x + 9y = 39\)

2) \(3x - 4y = 10\)
   \(16x + 8y = 10\)

**Provide the proper response.**

3) Identify whether the slope is positive, negative, zero or undefined.

4) Identify whether the slope is positive, negative, zero or undefined.

**Solve using the substitution method.** If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this.

5) \(5x + 3y = 80\)
   \(2x + y = 30\)

6) \(3y + x = -7\)
   \(x = 4y + 9\)
7) \( x + 7y = -2 \)
   \( 3x + y = 34 \)

Provide an appropriate response.

8) Does every straight line have an \( x \)-intercept? If not, give an example of an equation whose graph does not have an \( x \)-intercept.

9) Is it possible for the \( x \)-intercept and the \( y \)-intercept of a straight line to be at the same point? Explain your answer.

10) What can you say about a line if every point on the line has the same \( x \) coordinate?

11) Explain how you would find the \( x \) intercept of a line with an equation of the form \( Ax + By = C \).

12) What can you say about the graph of \( Ax + By = C \) if \( B \) is equal to zero?

13) What is the \( y \)-intercept of the line \( y = b \)?

Determine whether the pair of equations represents perpendicular lines.

14) \( 6x + 2y = 8 \)
   \( 18x + 6y = 27 \)

15) \( 3x - 4y = -12 \)
   \( 8x + 6y = -12 \)

Find the equation for the graph.

16)
Solve the system graphically. If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this.

18) \[ x = -3 \]
   \[ y = -7 \]

19) \[ 3x - 2y = 4 \]
   \[ -6x + 4y = 7 \]
Solve the system graphically. If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this. Label at least two points per line and the solution.

20) \( x = y - 9 \)
\( 5x = 2y \)

```
\begin{array}{|c|c|}
\hline
x & y \\
\hline
-10 & -8 \\
-8 & -6 \\
-6 & -4 \\
-4 & -2 \\
-2 & 0 \\
0 & 2 \\
2 & 4 \\
4 & 6 \\
6 & 8 \\
8 & 10 \\
\hline
\end{array}
```

Solve the system graphically. If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this.

21) \( x = y - 3 \)
\( 3x = 2y \)

```
\begin{array}{|c|c|}
\hline
x & y \\
\hline
-10 & -8 \\
-8 & -6 \\
-6 & -4 \\
-4 & -2 \\
-2 & 0 \\
0 & 2 \\
2 & 4 \\
4 & 6 \\
6 & 8 \\
8 & 10 \\
\hline
\end{array}
```

Solve using the elimination method. If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this.

22) \( \frac{1}{3}x - \frac{1}{4}y = 1 \)
\( \frac{2}{3}x + \frac{1}{2}y = 1 \)
23) $9x - 6y = -18$
   $-6x + 2y = 6$

24) $3r - 3s = 2$
   $-3r + 3s = 2$

25) $x - 3y = 9$
   $-7x - 3y = -39$

26) $-7x + 7y = -28$
   $-3x - 4y = -12$

Answer the question.
27) True or False? In quadrant IV, the y-coordinate is always positive.

28) True or False? The ordered pair $(-6, -9)$ determines a point in quadrant III with x-coordinate $-9$ and y-coordinate $-6$.

29) True or False? The ordered pair $(-8, 2)$ determines a point in quadrant II with x-coordinate $-8$ and y-coordinate $2$.

30) True or False? In quadrant II, the x-coordinate of a point is always negative.

31) True or False? The x-coordinate is positive in quadrants I and IV.

32) True or False? The ordered pair $(0, 0)$ determines a point in quadrant I with x-coordinate $0$ and y-coordinate $0$.

Write a slope-intercept equation of the line whose graph is described.
33) Parallel to the graph of $y = 3x - 7$; y-intercept $(0, -5)$

34) Perpendicular to the graph of $2x + y = 2$; y-intercept $(0, -5)$

Find the slope and the y-intercept of the line.
35) $-3x + 5y = -5$
Solve the problem.

36) A sum of money amounting to $3.05 consists of dimes and quarters. If there are 17 coins in all, how many are quarters? 36)

37) The sum of two numbers is 72, and twice their difference is 24. What is the smaller of the two numbers? 37)

38) Anne and Nancy use a metal alloy that is 24.5% copper to make jewelry. How many ounces of an alloy that is 23% copper must be mixed with an alloy that is 25% copper to form 88 ounces of the desired alloy? 38)

39) The following graph shows data for a recent train ride from New York to Toronto. At what rate did the train travel? 39)

![Graph showing train ride data]

Time of Day (PM)

40) Andy has 35 coins made up of quarters and half-dollars, and their total value is $13.00. How many quarters does he have? 40)

41) A student took out two loans totaling $13,000 to help pay for college expenses. One loan was at 6% simple interest, and the other was at 4%. After one year, the student owed $720 in interest. Find the amount of the loan at 4%. 41)

42) At 10:00 AM, Gavin rented a mountain bike. He returned the bike at 3:00 PM. He biked for 27.5 miles. He paid $104.00 for the rental. Find Gavin's average speed, in miles per hour. 42)

43) There were 620 people at a play. The admission price was $3.00 for adults and $1.00 for children. The admission receipts were $1320. How many adults and children attended? 43)

44) Two angles are complementary. The sum of the first angle plus twice the second angle is 148°. Find the measures of the angles. 44)

45) The perimeter of a rectangle is 56 cm. The length is 12 cm longer than the width. Find the dimensions. 45)
46) Jill is 13.5 kilometers away from Joe. Both begin to walk toward each other at the same time. Jill walks at 2.5 km/h. They meet in 3 hours. How fast is Joe walking?

47) Two angles are supplementary. One angle is $212^\circ$ less than three times the other. Find the measures of the angles.

48) In an isosceles triangle, each base angle is $10^\circ$ less than two times the third angle. Find the measures of all three angles.

49) An orchard operator must dilute 11 quarts of a 60%-insecticide solution by adding water. How many quarts of water should be added to get a mixture that is 2% insecticide?

50) John and Tony start from the same place at the same time and head for a town 10 miles away. John walks twice as fast as Tony and arrives 3 hours before Tony. Find the speed of each.

51) From a point on a river, two boats are driven in opposite directions, one at 5 miles per hour and the other at 6 miles per hour. In how many hours will they be 44 miles apart?

52) In a right triangle, one acute angle is $54^\circ$ more than twice the other. Find the measure of each acute angle.

53) Mrs. Boyd has a desk full of quarters and nickels. If she has a total of 32 coins with a total face value of $4.60, how many of the coins are nickels?

54) A contractor mixes concrete from bags of pre-mix for small jobs. How many bags with 5% cement should he mix with 4 bags of 13.5% cement to produce a mix containing 7% cement?

55) In a chemistry class, 4 liters of a 4%-saline solution must be mixed with a 10% solution to get a 6% solution. How many liters of the 10% solution are needed?

56) Joe has a collection of nickels and dimes that is worth $4.10. If the number of dimes was doubled and the number of nickels was increased by 17, then the value of the coins would be $7.05. How many dimes does he have?

57) A garage owner wants to fill a 55-gallon drum with a 20% winter mixture of antifreeze for his customers. How many gallons of 100% antifreeze should he mix with some 10% antifreeze mixture in order to fill the drum?

58) To the nearest dollar, the average tuition at a public four-year college was $3068 in 1997 and $3283 in 1998. Find, to the nearest dollar per year, the rate at which tuition was increasing.

59) An express train and a local train leave a station at the same time (on separate tracks) and head for a town 50 miles away. The express travels twice as fast as the local and arrives 1 hour ahead of the local. Find the speed of each train.
60) A woman made a deposit of $187. If her deposit consisted of 63 bills, all $1 bills or $5 bills, then how many $1 bills did she deposit?

61) A plane flying the 3922-mile trip from City A to City B has a 30-mph tailwind. The flight’s point of no return is the point at which the flight time required to return to City A is the same as the time required to continue to City B. If the speed of the plane in still air is 360 mph, how far from City A is the point of no return? Round your answer to the nearest mile.

62) To the nearest dollar, the average tuition at a public four-year college was $3052 in 1997 and $3249 in 2000. Find, to the nearest dollar per year, the rate at which tuition was increasing.

63) In a basketball game, Will scored 21 points, consisting only of three-point shots and two-point shots. He made a total of 9 shots. How many shots of each type did he make?

Solve by graphing.

64) The population, p, in thousands, of one town can be approximated by \( p = 6 + \frac{7}{5}d \), where \( d \) is the number of years since 1985. Use a graph to estimate the population of the town in the year 1992.

Graph the equation.

65) \( 45 + 5y = 0 \)
66) $3y + 9x = -27.$

67) $42 + 6y = 0.$

68) $3y + 6x = 15$
69) $y = 2x - 4$

70) $x + y = 2$

71) $2x - y = -2$
72) \( x + y = 4 \)

Find the \( x \)- and \( y \)-intercepts for the equation. Then graph the equation.

73) \( 6x - 12y = 0 \)

74) \( 3x + 4y = 20 \)
Find the x- and y-intercepts for the equation. Then graph the equation. Label the intercepts as ordered pairs on the graph.

75) \( x + y = 5 \)

76) \( 20y - 4x = -8 \)

77) \( -6x - 12y = 36 \)

78) \(( -2, -2) \) and \((-2, -4)\)
79) (2, 3) and (11, 15)  

80) (1, 2) and (7, 11)  

Find an equation of the line containing the given pair of points. Write your final answer in slope–intercept form.
81) (7, -6) and (3, -1)  

82) (8, -8) and (2, -1)  

83) (7, 5) and (0, 3)  

84) (-2, 0) and (-9, -4)  

85) (-1, 3) and (-4, -6)  

86) (-2, 7) and (5, -4)  

87) (4, 0) and (-6, 7)  

Decide whether or not the ordered pair is a solution to the equation.
88) x + y = 8; (4, 2)  

89) x + 2 = 0; (-2, 6)  

Find the coordinates of the y–intercept and the coordinates of all x–intercepts. Write as ordered pairs.
90)
Find the coordinates of the y–intercept and the coordinates of all x–intercepts.

91) 

Find the intercepts for the equation.

92) \(x = 7\)

93) \(-2x + y = -2\)

94) \(-4x - 2y = -4\)

Write an equation of the line containing the specified point and parallel or perpendicular, as indicated, to the given line. Write your final answer in slope–intercept form.

95) \((2, 6), \text{parallel to } y = -4x - 1\)

96) \((7, 2), \text{perpendicular to } 7x + 2y = 45\)

97) \((0, -6), \text{perpendicular to } y = -2x + 2\)

Write the equation of the line on the graph in slope–intercept form.

98) 

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Use the graph to solve the problem.

99) Find the rate of change of Simone’s salary.

Solve using any appropriate method. If the system has an infinite number of solutions, use set-builder notation to write the solution set. If the system has no solution, state this.

100) \(2x + 2y = 3\)
    \(9x + 9y = 18\)

Determine whether the ordered pair is a solution of the system of equations. Remember to use alphabetical order of variables.

101) \((-3, -1); x - y = -2\)
    \(y = 9x + 26\)

Find the slope of the line, or state that the slope is undefined if appropriate.

102)
103) $(3, 3)$ $(3, -3)$

Find the slope of the line. If the slope is undefined, state so.

104) $x = -4$

105) $y = 1$

Write an equation for the graph.

106)

Write an equation in slope-intercept form of the line satisfying the given conditions.

107) Parallel to $7x + 3y = 10$ and the same $y$–intercept as $9x - 5y = 3$. 

107) __________
Graph the specified line.

108) The line with slope $\frac{1}{6}$ that passes through the point $(0, 6)$

109) Find the slope-intercept equation for the line with the indicated slope and $y$-intercept.

109) Slope $\frac{1}{2}$, $y$-intercept $(0, 3)$
Answer Key
Testname: 115CH3&8P

1) Yes
2) No
3) Negative
4) Positive
5) (10, 10)
6) \[ \left( -\frac{1}{7}, -\frac{16}{7} \right) \]
7) (12, -2)
8) The x-intercept is the point where the line crosses the x-axis. Lines parallel to the x-axis do not intercept the x-axis. Thus the graph of any equation of the form \( y = b \) where \( b \neq 0 \) has no x-intercept.
9) Yes. If the line passes through the origin, then both the x-intercept and the y-intercept are at (0, 0).
10) The line is vertical.
11) Let \( y = 0 \) and solve for \( x \).
12) The graph is a vertical line.
13) (0, b)
14) No
15) Yes
16) \( y = x - 3 \)
17) \( y = -x + 6 \)
18) (-3, -7)
19) No solution
20) (6, 15)
21) (6, 9)
22) \( \left( \frac{9}{4}, -1 \right) \)
23) (0, 3)
24) No solution
25) (6, -1)
26) (4, 0)
27) False
28) False
29) True
30) True
31) True
32) False
33) \( y = 3x - 5 \)
34) \( y = \frac{1}{2}x - 5 \)
35) \( \frac{3}{5}; (0, -1) \)
36) 9
37) 30
38) 22 ounces
39) 60 miles per hour
40) 18
41) $3000
Answer Key
Testname: 115CH3&8P

42) 5.5 mph
43) Adults: 350; children: 270
44) 32°, 58°
45) Width: 8 cm; length: 20 cm
46) 2 km / h
47) 98°, 82°
48) 70°, 70°, 40°
49) 319 quarts
50) Tony: \(\frac{5}{3}\) mph; John: \(\frac{10}{3}\) mph

51) 4 hours
52) 12°, 78°
53) 17
54) 13 bags
55) 2.0 L
56) 21
57) \(6\frac{1}{9}\) gallons

58) $215 per year
59) Express: 50 mph; local: 25 mph
60) 32
61) 1798 miles
62) $66 per year
63) Two-point shots: 6; three-point shots: 3
64) About 16,000
65)
Answer Key
Testname: 115CH3&8P

66)

67)

68)
Answer Key
Testname: 115CH3&8P

69)

70)

71)
72)

73) (0, 0), (0, 0)

74)
Answer Key
Testname: 115CH3&8P

75) (0, 5), (5, 0)

76) \( (0, -\frac{2}{5}), (2, 0) \)

77) (0, -3), (-6, 0)

78) Undefined

79) \( \frac{4}{3} \)

80) \( \frac{3}{2} \)

81) \( y = -\frac{5}{4}x + \frac{11}{4} \)
82) $y = -\frac{7}{6}x + \frac{4}{3}$
83) $y = \frac{2}{7}x + 3$
84) $y = \frac{4}{7}x + \frac{8}{7}$
85) $y = 3x + 6$
86) $y = -\frac{11}{7}x + \frac{27}{7}$
87) $y = -\frac{7}{10}x + \frac{14}{5}$

88) No
89) Yes
90) (0, -8), (-8, 0), (8, 0)
91) (0, 8), (-4, 0), (-2, 0), (1, 0)
92) (7, 0)
93) (1, 0), (0, -2)
94) (1, 0), (0, 2)
95) $y = -4x + 14$
96) $y = \frac{2}{7}x + 0$
97) $y = \frac{1}{2}x - 6$
98) $y = \frac{5}{6}x + 5$

99) $3000$ per year
100) No solution
101) Yes
102) - $\frac{3}{2}$
103) Undefined
104) Undefined
105) 0
106) $y = 2$
107) $y = -\frac{7}{3}x - \frac{3}{5}$
108) $y = \frac{1}{2}x + 3$

109) $y = \frac{1}{2}x + 3$