Math 45 Review Practice Questions

*Note 1: The actual Math 45 final exam may include, but is not limited to, the problems in this handout. Study your notes, past homework assignments, quizzes, and tests. Also, see a tutor and/or your professor if you need any additional assistance.

*Note 2: NO NOTES OR GRAPHING CALCULATORS ARE ALLOWED ON THE FINAL EXAM.

Perform the indicated operation. Write in lowest terms.

1.) \( \frac{5}{3} - \left( -\frac{4}{9} \right) \)
   a) \( \frac{1}{3} \)  
   b) \(-1\)  
   c) \(-\frac{19}{9}\)  
   d) \(\frac{19}{9}\)  
   e) none of these

2.) \( 80 \div 0 \)
   a) undefined  
   b) 1  
   c) 80  
   d) 0  
   e) none of these

Evaluate the expression

3.) \( \frac{8 + (-4)^2 + 3 \cdot 5^2}{3^2 \cdot (5-3)} \)
   a) 1  
   b) \(\frac{11}{2}\)  
   c) 2  
   d) \(\frac{115}{12}\)  
   e) none of these

Simplify the algebraic expression.

4.) \( 3(4x + 5) - (9x - 2) \)
   a) \(3x + 13\)  
   b) \(3x + 7\)  
   c) \(21x + 17\)  
   d) \(3x + 17\)  
   e) none of these

Solve the equation. Check your solution.

5.) \( -\frac{2}{3}y = \frac{1}{2} \)
   a) \(\left\{-\frac{4}{3}\right\}\)  
   b) \(\left\{-\frac{3}{4}\right\}\)  
   c) \(\left\{\frac{3}{4}\right\}\)  
   d) \(\left\{\frac{9}{2}\right\}\)  
   e) none of these

6.) \( 5(2x - 5) = 9(x + 5) \)
   a) \(\{25\}\)  
   b) \(\{-20\}\)  
   c) \(\{20\}\)  
   d) \(\{70\}\)  
   e) none of these

7.) \( 3x - 7(4 + x) = -4(x + 9) \)
   a) \(\{-28\}\)  
   b) \(\{-36\}\)  
   c) all real numbers  
   d) \(\emptyset\)  
   e) none of these
Solve the problem.

8.) If two planes leave an airport at the same time with one flying west at 400 miles per hour and the other flying east at 260 miles per hour, how long will it take them to be 2640 miles apart?
   a) 4 hours    b) 3 hours    c) 5 hours    d) 3.5 hours    e) none of these

Solve the problem.

9.) After a 17% price reduction, a boat sold for $24070. What was the boat’s price before the reduction? (Round to the nearest cent, if necessary.)
   a) $20,572.65    b) $28,161.90    c) $29,000    d) $141,588.23    e) none of these

Solve the inequality and express the solution in set builder notation. Graph the solution set on a real number line.

10.) \(-5(4x - 14) \geq -25x + 35\)
   a) \(\{x | x \leq -7\}\)
   b) \(\{x | x \geq -7\}\)
   c) \(\{x | x > -7\}\)
   d) \(\{x | x < -7\}\)

Solve the problem.

11.) Two angles are supplementary. One angle is 240° less than three times the other. Find the measures of the angles.
   a) 100°, 80°    b) 110°, 70°    c) 120°, 120°    d) 105°, 75°    e) none of these
Graph the linear equation.

12.) \( y = \frac{1}{4}x + 2 \)

Provide an appropriate response.

13.) Given the equation \( 2x - 8y = 8 \), determine
(i) x-intercept    (ii) y-intercept

a) (i) (-1, 0)      b) (i) (4,0)      c) (i) (0,0)      d) (i) (-4,0)      e) none of these
   (ii) (0,4)        (ii) (0,-1)     (ii) (0,-1)     (ii) (0,-1) 

14.) Find the slope of the line that contains the points (4, 5) and (9, -2).

a) undefined      b) \( \frac{7}{5} \)          c) 0          d) \( -\frac{7}{5} \)      e) none of these

Write the equation of the line that satisfies the given conditions. Write the equation in slope-intercept form, if possible.

15.) contains (5, -33) and (3, -17)

a) \( y = -8x + 7 \)    b) \( y = 8x - 73 \)    c) \( y = -\frac{1}{8}x - \frac{259}{8} \)    d) \( y = \frac{1}{8}x - \frac{269}{8} \)      e) none of these

16.) contains (1, -7) and is perpendicular to \(-4x + 3y = 17\)

a) \( y = \frac{1}{3}x - \frac{17}{3} \)    b) \( y = -\frac{4}{3}x - \frac{4}{3} \)    c) \( y = -\frac{3}{4}x - \frac{25}{4} \)    d) \( y = \frac{3}{4}x - \frac{25}{4} \)      e) none of these
Graph the inequality.
17.) \(2x + y \leq -3\)

a) 

b) 

c) 

d) 

e) none of these

Graph the inequality.
18.) \(-2x < -6\)

a) 

b) 

c) 

d) 

e) none of these
Solve the system of equations.

19.) \[
\begin{align*}
    x + 2y &= 0 \\
    3x - 2y &= 8
\end{align*}
\]

a) No Solution  
b) (2, -1)  
c) (-1, 2)  
d) (2, 1)  
e) none of these

20.) \[
\begin{align*}
    -2.4x - 0.4y &= 0.32 \\
    4.2x + 0.6y &= -0.54
\end{align*}
\]

a) (0.2, -1)  
b) (-0.1, -0.2)  
c) (-0.1, -2)  
d) (-2, -1)  
e) none of these

21.) \[
\begin{align*}
    \frac{x}{2} + \frac{3y}{4} &= \frac{1}{2} \\
    -\frac{3x}{5} + \frac{3y}{4} &= -\frac{1}{20}
\end{align*}
\]

a) No Solution  
b) \(\left(\frac{1}{3}, \frac{1}{2}\right)\)  
c) infinitely many solutions  
d) \(\left(\frac{1}{2}, \frac{1}{3}\right)\)  
e) none of these

22.) \[
\begin{align*}
    2x - 3y &= 10 \\
    -4x + 6y &= -2
\end{align*}
\]

a) No Solution  
b) \(\left(-\frac{1}{3}, \frac{7}{3}\right)\)  
c) infinitely many solutions  
d) \(\left(\frac{7}{3}, -\frac{1}{3}\right)\)  
e) none of these

23.) \[
\begin{align*}
    5x - y &= -4 \\
    8x - y &= -5
\end{align*}
\]

a) No Solution  
b) \(\left(-\frac{1}{3}, \frac{7}{3}\right)\)  
c) infinitely many solutions  
d) \(\left(\frac{7}{3}, -\frac{1}{3}\right)\)  
e) none of these

Solve the problem.

24.) A twin-engine aircraft can fly 912 miles from city A to city B in 4 hours with the wind and make the return trip in 6 hours against the wind. Find the speed of the wind and the speed of the plane in still air.

a) wind 38 mph  
b) wind 57 mph  
c) wind 19 mph  
d) wind 190 mph  
e) none of these
Graph the system of linear inequalities.

25.) \[
\begin{align*}
y &\geq x + 3 \\
y &\geq 5 - x
\end{align*}
\]

a) 

b) 

c) 

d) 

e) none of these

Perform the indicated operation.

26.) \[(3m^3 + 7m^2 - 20) - (-8m + 8m^3 - 14)\]

a) \[-5m^3 + 7m^2 - 8m - 6\] 

b) \[-5m^3 + 15m^2 - 6\] 

c) \[-5m^3 + 7m^2 + 8m + 6\] 

d) \[-5m^3 + 7m^2 - 8m - 34\] 

e) none of these

27.) \[
\frac{8x^2 + 24x - 13}{4x}
\]

a) \[2x^2 + 6x - \frac{13}{4}\] 

b) \[2x^2 - 7\] 

c) \[2x + 6 - \frac{13}{4x}\] 

d) \[8x + 24 - \frac{13}{4x}\] 

e) none of these

Find the quotient using long division.

28.) \[
\frac{4m^3 + 30m^2 - 9m + 56}{m + 8}
\]

a) \[m^2 + 3m + 4\] 

b) \[4m^2 - 2m + 7\] 

c) \[m^2 + 2m + 4\] 

d) \[4m^2 + 2m + 7\] 

e) none of these
Simplify the expression. Write the answer with only positive exponents. All variables are nonzero.

29.) \((3x^4y)(-7x^5y^3)\)

a) \(-21x^9y^3\)  b) \(-21x^9y^4\)  c) \(-21x^{20}y^3\)  d) \(-10x^9y^3\)  e) none of these

Perform the indicated operation. Express the answer in scientific notation.

30.) \((1.4 \times 10^3)(3 \times 10^{11})\)

a) \(0.42 \times 10^{13}\)  b) \(4.2 \times 10^{14}\)  c) \(0.42 \times 10^{14}\)  d) \(0.42 \times 10^{15}\)  e) none of these

Provide an appropriate response.

31.) Find the GCF of \(12x^6y^8, 16x^5y^{10}\), and \(20x^8y^6\).

a) \(x^5y^6\)  b) \(4x^8y^{10}\)  c) \(4x^5y^6\)  d) \(4x^6y^8\)  e) none of these

Factor the polynomial completely. If the polynomial cannot be factored, say it is prime.

32.) \(x^4 - 1\)

a) \((x^2 + 1)^2\)  b) \((x^2 + 1)(x + 1)(x - 1)\)  c) \((x^2 + 1)^2\)  d) prime  e) none of these

Factor the polynomial completely. If the polynomial cannot be factored, say it is prime.

33.) \(1000y^3 + 343\)

a) \((10y + 7)(100y^2 + 70y + 49)\)  b) \((1000y - 7)(y^2 + 70y + 49)\)  c) \((10y - 7)(100y^2 + 70y + 49)\)  d) \((10y + 7)(100y^2 - 70y + 49)\)  e) none of these

34.) \(25x^2 + 49\)

a) prime  b) \((5x - 7)^2\)  c) \((5x + 7)(5x - 7)\)  d) \((5x + 7)^2\)  e) none of these

35.) \(9x^2 + 13x - 10\)

a) \((9x + 2)(x - 5)\)  b) \((9x + 5)(x - 2)\)  c) \((9x - 5)(x + 2)\)  d) prime  e) none of these
Solve the equation.

36.) \(4x^2 = 5x + 9\)

a) \(\left\{ \frac{4}{9}, 1 \right\}\)  
   b) \(\left\{ \frac{4}{9}, 0 \right\}\)  
   c) \(\left\{ \frac{4}{9}, -1 \right\}\)  
   d) \(\left\{ \frac{9}{4}, -1 \right\}\)  
   e) none of these

Solve the problem.

37.) The width of a rectangle is 6 kilometers less than twice its length. If the area of the rectangle is 56 square kilometers, find the dimensions of the rectangle.

a) width = 7km   
   b) width = 2km   
   c) width = 8km   
   d) width = \(\frac{56}{3}\)km   
   e) none of these

   length = 8km   
   length = 4km   
   length = 7km   
   length = 3km

Provide an appropriate response.

38.) Evaluate \(\frac{6x - 4y^2}{24z}\) when \(x = 4, y = -6,\) and \(z = -1\)

a) 7  
   b) 1  
   c) 5  
   d) 6  
   e) none of these

Solve the problem.

39.) Bob needs to wash the windows on his house. He has a 17-foot ladder and places the base of the ladder 8 feet from the wall on the house. How far up the wall will the ladder reach?

a) 14 ft  
   b) 13 ft  
   c) 15 ft  
   d) 16 ft  
   e) none of these

Solve the system of equations for the variable “x”.

40.) \(\begin{cases} -0.8x - 0.5y = 3.3 \\ -0.4x - 0.1y = 0.9 \end{cases}\)

a) \(x = -1\)  
   b) \(x = -5\)  
   c) infinitely many solutions  
   d) no solution  
   e) none of these

Solve the problem.

41.) Two trains leave a city on parallel tracks, traveling the same direction. The passenger train is going twice as fast as the freight train. After 45 minutes, the trains are 30 miles apart. Find the speed of the freight train.

a) 40 mph  
   b) 80 mph  
   c) 20 mph  
   d) 65 mph  
   e) none of these
Use the right triangle shown and find the missing length. If necessary, round to three decimal places.

42.)
\[ a \]
\[ b \]
\[ c \]

\[ b = 6, \ c = 10 \]

a) 8  b) 11.662  c) 2  d) 64  e) none of these

Solve the problem.
43.) Chandra has 2 liters of a 14% solution of sodium hydroxide in a container. What is the amount and concentration of sodium hydroxide solution she must add to this in order to end up with 7 liters of a 34% solution?

a) 5 L of 40% solution  b) 5 L of 45% solution c) 5 L of 43% solution  d) 5 L of 42% solution  e) none of these

Graph the linear equation.
44.) \[ y = -2x - 4 \]

45.) \[
\begin{align*}
x + 3y &= 6 \\
9y &= -3x + 18
\end{align*}
\]

a) (2, 2)  b) \( \emptyset \)  c) \( \{(x, y) | x + 3y = 6\} \)  d) \( \left( \frac{1}{6}, \frac{2}{3} \right) \)  e) none of these
Solve the problem.

46.) Find the length of the longer leg of a right triangle if the shorter leg is 4 meters less than the longer leg and the hypotenuse is 20 meters.

a) 13 m  b) 12m  c) 16 m  d) 15 m  e) none of these

47.) In a triangle, the second angle measures four times the first. The measure of the third angle is 18° more than the second. Find the measures of the three angles.

a) 18°, 72°, 90°  b) 10°, 40°, 130°  c) 28°, 42°, 110°  d) 20°, 80°, 80°  e) none of these

State the property of real numbers that is being illustrated.

48.) \( 23 + 5 + (-23) = 23 + (-23) + 5 \)

a) Commutative property of addition  
b) Distributive property  
c) Additive identity property  
d) Associative property of addition  
e) none of these

49.) \( 3 \cdot (5 \cdot 4) = (3 \cdot 5) \cdot 4 \)

a) Commutative property of multiplication  
b) Distributive property  
c) Multiplicative identity property  
d) Associative property of multiplication  
e) none of these

Solve the equation. Check your solution.

50.) \( \frac{n}{2} + \frac{2}{3} = \frac{n}{6} \)

a) \( \{ -\frac{4}{3} \} \)  
b) \( \{-2\} \)  
c) \( \{\frac{3}{4}\} \)  
d) \( \{2\} \)  
e) none of these

51.) \( \frac{m}{8} + \frac{m}{2} = \frac{3}{4} \)

a) \( \{-\frac{6}{5}\} \)  
b) \( \{-\frac{5}{6}\} \)  
c) \( \{\frac{6}{5}\} \)  
d) \( \{\frac{5}{6}\} \)  
e) none of these

52.) \( -\frac{2}{3}x + \frac{3}{4} = \frac{1}{3} \)

a) \( \{-\frac{8}{5}\} \)  
b) \( \{-2\} \)  
c) \( \{\frac{5}{8}\} \)  
d) \( \{\frac{8}{5}\} \)  
e) none of these
Solve the inequality and express the solution in set builder notation. Graph the solution set on a real number line.

53.) \(-4(x - 1) \leq x + 8\)

a) \(-4 \leq \frac{5}{4} \) \(\{x \mid x \leq -\frac{4}{5}\}\)

b) \(-4 \geq \frac{5}{4} \) \(\{x \mid x \geq -\frac{4}{5}\}\)

c) \(-4 > \frac{5}{4} \) \(\{x \mid x > -\frac{4}{5}\}\)

d) \(-4 < \frac{5}{4} \) \(\{x \mid x < -\frac{4}{5}\}\)

e) none of these

Write the equation of the line that satisfies the given conditions. Write the equation in slope-intercept form, if possible.

54.) contains \((-7, 2)\) and parallel to the line \(x + 4y = 2\)

a) \(y = \frac{1}{4}x - \frac{17}{3}\)

b) \(y = -\frac{1}{4}x - \frac{4}{3}\)

c) \(y = \frac{1}{4}x - \frac{25}{4}\)

d) \(y = -\frac{1}{4}x + \frac{1}{4}\)

e) none of these

Factor completely. Identify ONE of the factors.

55.) \(18ax - 9ay - 12bx + 6by\)

a) \((2x + y)\)

b) \((3a + 2b)\)

c) \((3a - 2b)\)

d) \((3x - y)\)

e) none of these

Divide and simplify.

56.) \(\frac{12x^4y^4 + 8x^2y^2 - 4xy}{4x^3y}\)

a) \(3xy^3 + \frac{2y}{x} - \frac{1}{x^2}\)

b) \(xy^3 - \frac{2y}{x} + \frac{1}{x^2}\)

c) \(\frac{3x}{y} + \frac{2y}{x} - \frac{1}{x^2}\)

d) \(3y^3 + \frac{2y}{x} - \frac{y}{x^2}\)

e) none of these

Find the intercepts of the equation.

57.) \(-\frac{1}{x}x + 2y = 2\)

a) \((-3, 0), (0, 2)\)

b) \((-6, 0), (0, 1)\)

b) \((1, 0), (0, -6)\)

d) \((\frac{2}{3}, 0), (0, 1)\)

e) none of these
Solve the problem.

58.) Find the measure of two complementary angles if the larger angle is $26^\circ$ more than the smaller angle.

a) $32^\circ$ and $58^\circ$   b) $23^\circ$ and $67^\circ$   c) $26^\circ$ and $64^\circ$   d) $26^\circ$ and $154^\circ$   e) none of these

Find the prime factorization.

59.) 120

a) $2 \cdot 2 \cdot 3 \cdot 5$   b) $2 \cdot 2 \cdot 3 \cdot 10$   c) $2 \cdot 3 \cdot 5$   d) $2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$   e) none of these

Replace the ? with the correct symbol $> , < , =$.

60.) $|−18| ? |−5|$

a) $>$   b) $<$   c) $=$   d) none of these

Find the slope of the line.

61.)

a) $-2$   b) $-1$   c) $-7$   d) $-\frac{2}{3}$   e) none of these

Find the slope of the line.

62.)

a) $-2$   b) $-1$   c) $-7$   d) $-\frac{2}{3}$   e) none of these
Perform the indicated operation. Express the answer in scientific notation.

63.) \[
\frac{3 \times 10^{-17}}{4 \times 10^{21}}
\]

a) \(0.75 \times 10^{-38}\)  b) \(7.5 \times 10^{40}\)  c) \(7.5 \times 10^{-40}\)  d) \(7.5 \times 10^{-39}\)  e) none of these

Determine the number of solutions of the system. State whether the system is consistent or inconsistent. For a system that is consistent, state whether the equations are dependent or independent. State the solution of the system.

64.)

a) no solution; inconsistent
b) infinitely many solutions; inconsistent; dependent

c) one solution; consistent; independent; \((-2, 1)\)
d) one solution; consistent; independent; \((1, -2)\)
e) none of these

Decide whether or not the ordered pair is a solution to the equation.

65.) \[
\frac{2}{3}x - 5y = 8; \left(6, -\frac{4}{5}\right)
\]

a) Yes  b) No  c) none of these

Simplify the expression.

66.) \[
\frac{2}{3} \left[\frac{4}{25} \div \left(\frac{2}{5} - \frac{3}{10}\right)^2 - 7\right]
\]

a) 2  b) -5  c) -6  d) 6  e) none of these
Identify the graph that contains the solution to the system of equations.

67.) \[
\begin{align*}
3x - 4y &= -12 \\
2x + 4y &= -8
\end{align*}
\]

Solve the formula for the stated variable.

68.) \[V = \frac{1}{3} Bh\]; solve for \(B\)

a) \(B = \frac{3V}{h}\)  

b) \(B = \frac{3h}{V}\)  

c) \(B = 3Vh\)  

d) \(B = \frac{V}{3h}\)  

e) none of these

Solve the formula for the stated variable.

69.) \[A = \frac{1}{2} h(B + b)\]; solve for \(b\)

a) \(b = \frac{2A-B}{h}\)  

b) \(b = \frac{2A-Bh}{h}\)  

c) \(b = \frac{2A-2B}{h}\)  

d) \(b = \frac{2A-Bh}{Bh}\)  

e) none of these

Solve the formula for the stated variable.

70.) \(\frac{2}{3} x - \frac{5}{2} y = 5\); solve for \(y\)

a) \(y = \frac{4}{15} x - \frac{2}{15}\)  

b) \(y = \frac{4}{15} x - 2\)  

c) \(y = -\frac{4}{15} x - 2\)  

d) \(y = -\frac{4}{15} x + 2\)  

e) none of these
Identify the real number line where the following points are plotted correctly.

71.) \( \{ -2, -1 \frac{1}{2}, -\frac{1}{3}, 1 \frac{5}{6} \} \)

a) 

b) 

c) 

d) 

e) none of these

Write the equation of the line that has the given properties. Write the equation in slope-intercept form, if possible.

72.) contains \((-3, -4)\); has slope \(\frac{3}{2}\)

a) \(y = -4x + \frac{3}{2}\)  

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

c) \(y = \frac{3}{2}x - \frac{259}{8}\)  

d) \(y = \frac{3}{2}x + \frac{1}{2}\)  

e) none of these

Solve the problems.

73.) An airplane flying 25,350 feet is directly over a submarine that is 375 feet below sea level. What is the distance between a person in the plane and a person in the submarine?

a) 24,975 ft  

b) 25,725 ft  

c) 25,350 ft  

d) 375 ft  

e) none of these

74.) Tickets to a student theater production cost $8 for students and $10 for nonstudents. The receipts for opening night came to $3270 from selling 390 tickets. How many student tickets were sold?

a) 300 tickets  

b) 75 tickets  

c) 150 tickets  

d) 315 tickets  

e) none of these

75.) In a recent poll conducted by Zogby International of 1200 adult Americans, 840 stated that they believe that they eat healthy foods. What percentage of adult Americans believe that they eat healthy foods?

a) 70%  

b) 75%  

c) 68.5%  

d) 65%  

e) none of these
Simplify.

76.) \((-3x^4y^0)^2\)

a) \(-9x^8y^2\)  
b) \(9x^8\)  
c) \(9x^8y^2\)  
d) 1  
e) none of these

Graph the inequality.

77.) \(2x - y \leq -3\)

a) 

b) 

c) 

d) 

e) none of these

Simplify.

78.) \((-\frac{a^7}{b^5})^7\)

a) \(\frac{a^{42}}{b^{30}}\)  
b) \(\frac{a^{49}}{b^{35}}\)  
c) \(-\frac{a^{14}}{b^{12}}\)  
d) \(-\frac{a^{49}}{b^{35}}\)  
e) none of these
Math 45 Review Practice Answers

1. d  49. d
2. a  50. b
3. b  51. c
4. d  52. c
5. b  53. b
6. d  54. d
7. d  55. c
8. a  56. a
9. c  57. b
10. b  58. a
11. d  59. d
12. d  60. a
13. b  61. e
14. d  62. a
15. a  63. d
16. c  64. c
17. d  65. a
18. c  66. d
19. b  67. b
20. b  68. a
21. d  69. b
22. a  70. b
23. b  71. c
24. a  72. d
25. c  73. b
26. e  74. d
27. c  75. a
28. b  76. b
29. b  77. d
30. b  78. d
31. c
32. b
33. d
34. a
35. c
36. d
37. c
38. c
39. c
40. a
41. a
42. a
43. d
44. c
45. c
46. c
47. a
48. a