

- Basic Steps to solving Equations:
 1. Get variable terms on one side of the equation (addition property of equality)
 2. Get constant terms on one side of the equation (addition property of equality) (constants should be on the opposite side of the variable terms).
 3. Divide both sides of the equation in order to isolate the variable
 4. Check your answer by plugging it into the original equation and see if the two sides are equal.

- Convert fraction into a decimal: Divide the numerator by denominator with long division. Keep adding zeros after the decimal and dividing until you get a zero remainder or it repeats.

- Convert decimal into a fraction: Identify the place value the decimal ends in. Then remove the decimal and put the number over that place value. Simplify.

- Convert improper fraction into a mixed number: Divide the numerator by the denominator. The quotient is the whole. The remainder is the numerator. The denominator stays the same.

- Convert a mixed number into an improper fraction: Multiply the whole part times the denominator and add the numerator. This answer is the numerator of the improper fraction. The denominator stays the same.

- Convert a fraction or decimal into a percent: Multiply the fraction or decimal by 100. Add the percent symbol.

- Convert a percent into a decimal or fraction: Remove the percent symbol and divide by 100. Simplify.

- To multiply fractions: Multiply the numerators and denominators and simplify. (You may also simplify first.)

- To divide fractions: Flip the divisor (2nd fraction). Then multiply the numerators and denominators and simplify.

- To add or subtract fractions: Convert both fractions into equal fractions with a common denominator. Add or subtract the numerators. Keep the denominator the same. Simplify your answer if needed.

- To multiply or divide mixed numbers: First convert them into improper fractions. Then multiply or divide as you would any fractions. If the answer is improper, you can convert it back into a mixed number.

- To add mixed numbers: Get the common denominator and add the fraction parts. Add the whole numbers. If the answer is improper, you can convert it back into a mixed number and add it to the remaining whole part.
- To subtract mixed numbers: Get the common denominator and subtract the fraction parts. (May need to borrow first). Then subtract the whole numbers.

Formulas: You do not need to memorize these. (Just know how to use them.)

Z-score (statistics): $z = \frac{(x - \mu)}{\sigma}$

Temperature conversions between Fahrenheit and Celsius: $F = 1.8 \times C + 32$ $C = \frac{F - 32}{1.8}$

Perimeter of a rectangle: $P = 2L + 2W$ (adding up the two lengths and the two widths)

Volume of a box: $V = L \cdot W \cdot H$ (multiplying length, width, and height) the unit of measurement is cubed

$\frac{\text{Percent}}{100} = \frac{\text{Amount}}{\text{Total}}$ Solve general percent problems. We can find the percent, amount, or total by setting the cross products equal and solving. Remember the percent is already converted because it is over 100.

$C = T \times r$ This formula is used to calculate the amount of commission made when a person sells T amount of money in merchandise and r is the commission rate percent. Remember to convert r into a decimal or fraction before plugging it in. If we solve for r , we will need to convert our answer back to a percent.

$I = P \times r \times t$ This formula is used to calculate the amount of simple interest made when a person invests P amount of money in an account at an interest rate r percent for t number of years. Remember to convert r into a decimal or fraction before plugging it in. If we solve for r , we will need to convert our answer back to a percent.

$T = A + rA$ This is the classic percent of increase formula that can be used both for taxes and for markup problems. The A is the amount before tax or markup. The T is the total after tax or after markup and r is the tax rate or markup rate percent. Remember to convert r into a decimal or fraction before plugging it in. If we solve for r , we will need to convert our answer back to a percent.

$T = A - rA$ This is the classic percent of decrease formula that can be used for discount sales price problems. The A is the amount before the discount. The T is the total after the discount and r is the discount rate percent. Remember to convert r into a decimal or fraction before plugging it in. If we solve for r , we will need to convert our answer back to a percent.

The equation of a line with slope m and y -intercept $(0, b)$. If you do not know the slope or y -intercept you can use the slope and y -intercept formula between points (x_1, y_1) and (x_2, y_2) .

$$y = m x + b$$
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$b = y_1 - m x_1$$

Math Jam for Final Exam (*Estimated time: 2 hours*)

Do not use a calculator. Your final exam will be timed at 2 hours and will have approximately 40 questions. The final exam will be longer than your chapter exams. In addition to working through the practice jam questions, you should review your notes and exams.

Chapter 1 Material

1. Find the value, if possible: $0 \div 4$

2. Find the value, if possible: $\frac{13}{0}$

3. Use the statistics formula for the z-score

$$z = \frac{(x - \mu)}{\sigma}$$

Find the z-score if

$$x = 237, \mu = 141, \sigma = 32$$

A z-score larger than two is considered unusual. Is this an unusual z-score?

4. Use order of operations to find the value of: $79 - 15 + 4^2 \times \sqrt{81}$

5. Multiply: $5,000 \times 1,400$

6. Calculate the volume of a box that is 23 cm by 16 cm by 100 cm. (Include the correct units in your answer.)

7. Use the perimeter to calculate how many feet of crown molding you must purchase for a room that is 13 feet long by 11 feet wide. (Include the correct units in your answer.)

Chapter 2 Material

8. Round to the nearest ones place
 - a. 0.74386
 - b. 78.462
9. Round to the nearest tenths place
 - a. 0.053289
 - b. 72.973
10. Round to the nearest hundredths place
 - a. 0.03792
 - b. 8.00374
11. Round to the thousandths place
 - a. 0.059898
 - b. 3.745117
12. Subtract: $14.2 - 4.75$
13. Multiply: 0.007×0.24
14. Find the value of: $(0.3)^2$
15. Find the value: $0.816 \div 100$
16. Divide: $4.16 \div 0.2$

17. Write the following numbers in scientific notation
 - a. 0.000132
 - b. 7,400,000
18. How many significant figures do the following numbers have?
 - a. 0.007108
 - b. 50,800,000

Chapter 3 Material (Reduce your fraction answers.)

19. Convert 15.4 pounds into kilograms.
(1 kg = 2.2 pounds)
20. Convert 2.468 grams into milligrams.
(1 g = 1000 mg)
21. Convert 80 kilometers per hour into miles per hour. (1 kph = 0.62 mph)
22. Convert 10.5 inches into centimeters.
(1 in \approx 2.54 cm)
23. Convert $3\frac{4}{5}$ into an improper fraction.
24. Convert $\frac{47}{8}$ into a mixed number.
25. Convert 0.35 into a fraction in simplest form.
26. Convert $2\frac{1}{9}$ into a decimal. Put a bar over any repeating parts.
27. Write a fraction equivalent to $\frac{7}{9}$ with a denominator of 72. (Do not simplify.)

28. Convert the fraction $\frac{30}{120}$ into simplest form .
29. Convert the fraction $\frac{126}{144}$ into simplest form.
30. Add: $\frac{5}{8} + \frac{2}{7}$
31. Subtract: $\frac{9}{10} - \frac{5}{12}$
32. Add: $5\frac{5}{6} + \frac{5}{7}$
33. Marcy is a pastry chef at a restaurant. At the start of the day, Marcy had $45\frac{1}{3}$ cup of flour. While baking, she used $18\frac{3}{4}$ cups of flour. How much flour is left? (Include the correct units in your answer.)

34. Maria owed \$15,000 in student loans.
She has paid two-thirds of the loan.
How much has she paid?

Chapter 4 Material

35. Find the following absolute values:

a. $|-3.5|$

b. $|12|$

c. $|0|$

d. $\left|-4\frac{1}{8}\right|$

36. $-150 + (-42)$

37. -15×-3

38. $-7.31 + 9$

39. $(-325) - (-75)$

40. $\left(-\frac{11}{12}\right) + \frac{3}{8}$

41. $\frac{-5}{-1}$

42. $\frac{-5}{0}$

43. $\frac{0}{-5}$

44. $\frac{-56}{8}$

45. $85 \times (-32) \times 0 \times 10$

46. $\frac{7}{18} \div \left(-\frac{14}{9}\right)$

47. $-3.42 \div 0.3$

48. Find the value of the following:

a. -2^4

b. $(-2)^4$

c. -3^3

d. $(-3)^3$

e. $(-1)^{20}$

f. $(-1)^{25}$

g. $(-10)^4$

h. -9^2

i. $(-6)^2$

j. $3(-8)^2$

Chapter 5 Material

49. Simplify: $-4x(5yz)$

Is your answer a monomial, binomial, or trinomial?

What is the coefficient of your answer?

What is the variable part of your answer?

What is the degree of your answer?

50. Simplify: $\frac{1}{2}(24ab)$

51. Simplify: $7(2y - 10) + 50$

52. Simplify: $4p - (3p + 18)$

Is your answer a monomial, binomial, or trinomial?

53. Solve: $25 + 5n - 24 = -3n + 18 + 8n$

54. Solve: $26x + 19 - 21x = 5x + 19$

55. Solve: $13 = v - 7$

56. Solve: $5 = 20x$

57. Solve: $3b = -\frac{1}{5}$

58. Solve: $\frac{x}{17} = -3$

59. Solve: $\frac{2}{7}y = \frac{3}{5}$

(Write your answer as a decimal.)

60. Solve: $-5.2d + 7.3 = -6.2d - 3.6$

61. Solve: $\frac{2}{3}(w + 6) = \frac{1}{4}(w - 8)$

(Write your answer as a mixed number.)

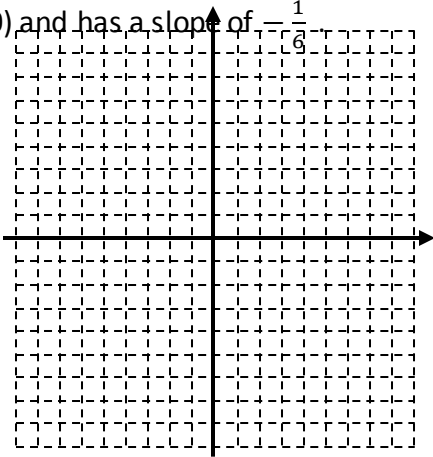
62. Solve: $0.23x - 0.4 = 0.38x + 0.2$

63. Solve: $\frac{3w}{7} = \frac{2w+5}{4}$

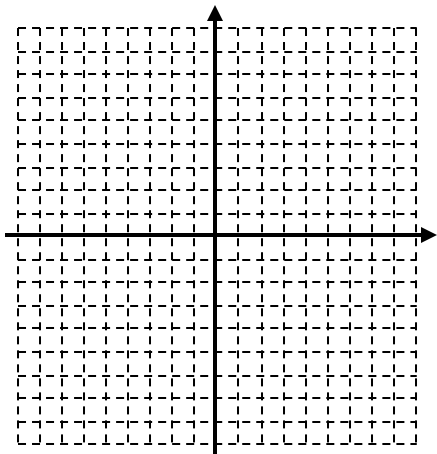
(Write your answer as a decimal.)

Chapter 7 Material (Chapter 6 is at the end)

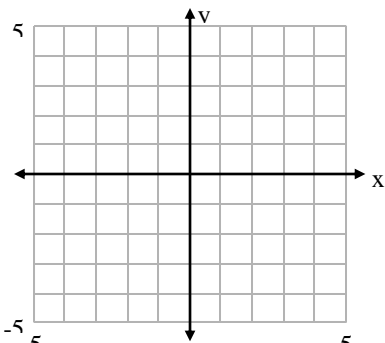
64. Draw a line that goes through the point $(-4,0)$ and has a slope of $-\frac{1}{8}$.



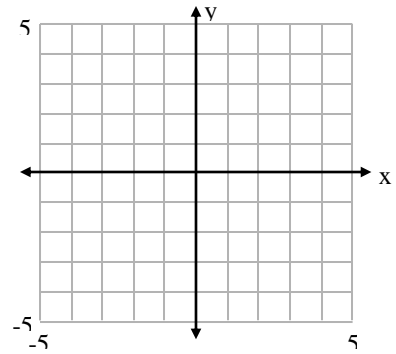
65. Draw a line that goes through the point $(-6, -4)$ and has a slope of $\frac{3}{5}$.



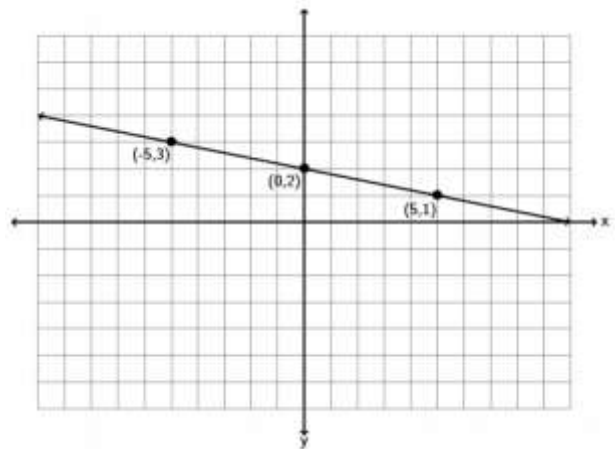
66. Draw a line that goes through the point $(-3, -2)$ and has a slope $= 0$.



67. Graph the line $3x - 2y = 6$ by finding the x and y-intercepts.



68. Find the equation of the line in slope intercept form described by the following line? Remember, you will need to find the slope m and the y intercept $(0,b)$ first.



69. Use the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ to find the slope of the line between $(-4, -1)$ and $(-7, 7)$. Be sure to simplify your answer and write it in lowest terms, if possible.

70. Find the slope and y-intercept of the following line. (Hint: Solve the equation for y first.)
 $3x - 6y = 20$

(slope) _____

(y-int) _____
Write as an ordered-pair.

71. A company that makes lawn furniture looked at their average costs in year 3 to be \$47000 and the average costs in year 8 to be \$51000.

Find the equation of a line that could be used to estimate the company's costs (y) if we knew the year (x).

Chapter 6 Material

72. The product of a number and three is equivalent to the sum of the number and fourteen.

Find the number.

Translate the sentence into an equation: _____

Now solve.

Answer = _____

73. Two more than the quotient of a number and five is the same as four. Find the number.

Translate the sentence into an equation:

Now solve.

Answer = _____

74. Suppose a political science club is divided into three groups: liberal, moderate, and conservative.

There are twice as many liberals as moderates and there are seven more conservatives than moderates. If the club has a total of 75 members, how many are in each group?

Label your variables: _____

Write your equation: _____

Now solve.

Number of liberals: _____ Number of moderates: _____ Number of conservatives: _____

75. Convert 0.0005 into a percentage. _____

76. Convert $\frac{2}{5}$ into a percentage. _____

77. David bought some basketball shoes for \$49.05 with tax included. If the price of the shoes before tax was \$45, what is the sales tax rate in David's area? **Write your answer as a percent.**

(Use $T = A + rA$.)

Write your equation with the numbers being substituted for the appropriate variables:

Now solve your equation.

Answer = _____(include units)

78. Tyra bought a beautiful dress to wear to a New Year's Eve party. If the dress was on sale for 35% off and the sale price was \$234, what was the regular price of the dress before the sale? (Use $T = A - rA$.)

Write your equation with the numbers being substituted for the appropriate variables:

Now solve your equation.

Answer = _____(include units)

79. It is estimated that 5% of Americans over the age of 65 live in nursing homes. If a town has a total of 8200 adults over the age of 65, how many do we expect to live in a nursing home?

Write your equation (proportion): _____

Now solve.

Answer = _____(include units)

80. Mario sells cars and earns a 6% commission on all he sells. If he made a commission of \$1,800 on one car he sold, what was the total price of the car? (Use $C = T \times r$.)

Write your equation with the numbers being substituted for the appropriate variables:

Now solve your equation.

Answer = _____(include units)

81. Tianna invested some money into some stocks that provided \$345 in simple interest at the end of 2 years. If the interest rate was 7.5%, how much did she originally invest?

(Use $I = P \times r \times t$)

Write your equation with the numbers being substituted for the appropriate variables:

Now solve your equation.

Answer = _____(include units)

82. The area of a triangular region is given by the formula $A = \frac{b \times h}{2}$ where b is the base and h is the height of the triangle. Find the height of a triangle whose base is 3.5 feet and whose area is 13.6 square feet. **Round your answer to the nearest tenth.**

Write your equation with the numbers being substituted for the appropriate variables:

Now solve your equation.

Answer = _____(include units)

83. We used regression theory in statistics to find a formula that will predict the weight of a black bear based on its age. The formula was $W = 65.2 + 2.7A$ where A is the age of the bear in months and W is the weight of the bear in pounds. Forest rangers caught a black bear in the wild and found the weight to be 194.8 pounds. How old do we predict the bear to be?

Write your equation with the number being substituted for the appropriate variable:

Now solve your equation.

Answer = _____(include units)

Answer Key

- 0
- Undefined
- $z = 3$ (unusual z-score)
- 208
- 7,000,000
- 36,800 cubic cm
- 48 feet
- a) 1 b) 78
- a) 0.1 b) 73.0
- a) 0.04 b) 8.00
- a) 0.060 b) 3.745
- 9.45
- 0.00168
- 0.09
- 0.00816
- 20.8
- a) 1.32×10^{-4} b) 7.4×10^6
- a) 4 sig figs b) 3 sig figs
- 7 kg
- 2468 mg
- 49.6 mph
- 26.67 cm
- $\frac{19}{5}$
- $5\frac{7}{8}$
- $\frac{7}{20}$
- $2.\bar{1}$

27. $\frac{56}{72}$

28. $\frac{1}{4}$

29. $\frac{7}{8}$

30. $\frac{51}{56}$

31. $\frac{29}{60}$

32. $6\frac{23}{42}$

33. $26\frac{7}{12}$

34. \$2000

35. a) 3.5 b) 12 c) 0 d) $4\frac{1}{8}$

36. -192

37. +45

38. +1.69

39. -250

40. $-\frac{13}{24}$

41. +5

42. Undefined

43. 0

44. -7

45. 0

46. $-\frac{1}{4}$

47. -11.4

48. a) -16 b) +16 c) -27 d) -27 e) +1 f) -1 g) 10000 h) -81 i) +36 j) +192

49. $-20xyz$, Monomial , numerical coefficient is -20 , variable part is xyz , 3rd degree

50. $12ab$

51. $14y - 20$

52. $1p - 18$ or $p - 18$, Binomial

53. No Solution

54. All Real Numbers

55. $v = 20$

56. $x = \frac{1}{4}$

57. $b = -\frac{1}{15}$

58. $x = -51$

59. $y = 2.1$

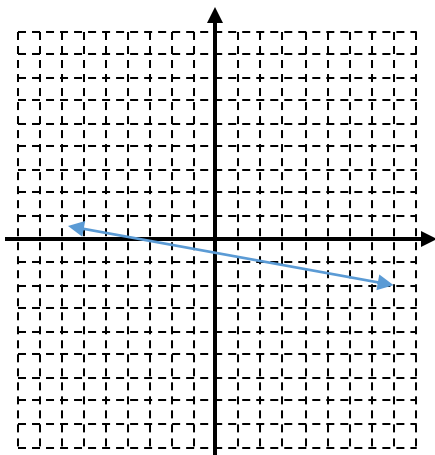
60. $d = -10.9$

61. $-14\frac{2}{5}$

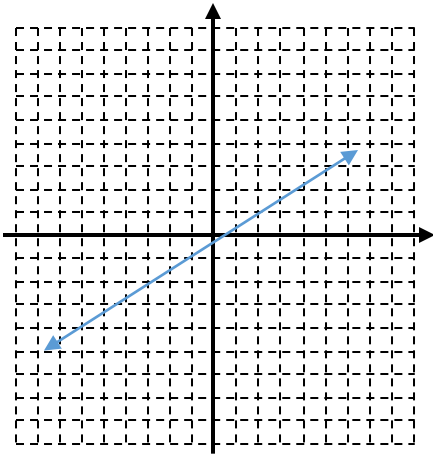
62. $x = 4$

63. $w = -17.5$

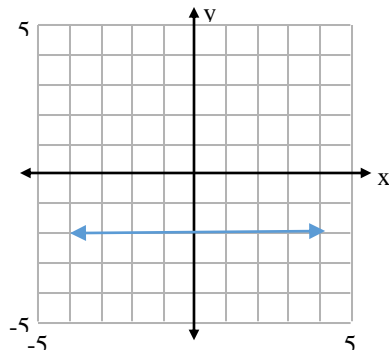
64.



65.

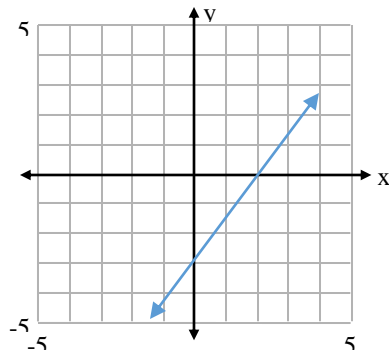


66.



67. X intercept: (2, 0)

Y intercept: (0, -3)



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

69. Slope $m = -\frac{8}{3}$

70. Slope $m = +\frac{1}{2}$, Y intercept = $(0, -3\frac{1}{3})$

71. $y = 800x + 44600$

72. $3n = n + 14$, $n = 7$

73. $\frac{n}{5} + 2 = 4$, $n = 10$

74. Moderates: x , Liberals: $2x$, Conservatives: $x + 7$
 $x + 2x + x + 7 = 75$

17 Moderates, 34 Liberals, 24 Conservatives

75. 0.05%

76. 40%

77. $49.05 = 45 + 45r$, $r = 9\%$

78. $234 = A - 0.35A$, Regular = \$360

79. $\frac{5}{100} = \frac{x}{8200}$, 410 seniors in nursing homes

80. $1800 = 0.06T$, \$30,000

81. $345 = 2(0.075)P$, $P = \$2300$ invested

82. $13.6 = \frac{3.5h}{2}$, $h = 7.8$ feet

83. $194.8 = 65.2 + 2.7A$, $A = 48$ months old