MATH 0100 Review for the Final Exam

The problems for this review of MATH 0100 are listed below each learner outcome for this course. Use a separate sheet of paper to do the work. Do not use a calculator.

1. Add, subtract, multiply, and divide integers, fractions and decimals.

1. Evaluate and simplify the following.

a. $|-5|$

b. $(-88)\div(-22)$

c. $10-4\frac{5}{8}$

d. Find the sum of $5\frac{7}{8}$ and $\frac{5}{12}$

e. $(0.0098)(10{,}000)$

f. $1\frac{5}{6}\div 22$

g. Find the quotient of $\frac{3}{2}$ and $-\frac{6}{5}$

h. $-\frac{27}{55}-\frac{4}{11}$

i. Find the product of $\frac{4}{21}$ and $\frac{28}{64}$

j. $48.73\div 1000$

2. Consider the decimal number 628.975
   a. Name the decimal place value of the digit 7.
   b. Which digit is in the tenths place?
   c. Name the decimal place value of the digit 5.
   d. Round 628.975 to the nearest tenths.

3. Write thirty-eight thousand six and fourteen thousandths in standard form.

4. Consider the expression $10x^2-7x+3$

   a. Name the coefficient of the middle term.

   b. How many terms in this algebraic expression?

5. Divide. Round the answer to the nearest hundredths. $0.4345\div 0.07$

6. Are these mathematical statements True or False?

   a. $\frac{2}{-7}=\frac{-2}{7}=-\frac{2}{7}$ b. $\frac{5}{0}=0$ c. $\frac{-6}{-6}=1$ d. $\frac{0}{7}=0$

7. Write the equivalent of $\frac{2}{13}$ using a denominator of $39x$. $\frac{2}{13}=\frac{?}{39x}$

8. Write 70% as a fraction reduced to lowest terms.

9. Write 8.4% as a decimal.

10. Write 2.3 as a percent.

11. Reduce $\frac{72}{180}$ to lowest terms.

12. Fill in the correct symbol (> or <) to make a true statement. $\frac{9}{16}$ _____ 0.5825

13. Change 0.325 to a fraction and reduce to lowest terms.

14. Change $\frac{187}{6}$ to a mixed number.

15. Change $7\frac{5}{8}$ to an improper fraction.

16. Find the GCF of 12 and 18.

17. Find the LCM of 12 and 18.

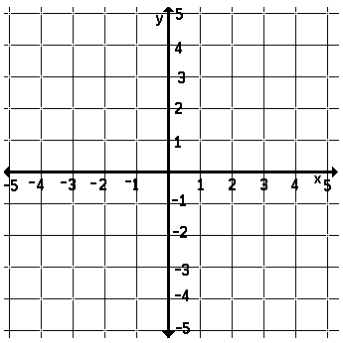
18. List these fractions from smallest to largest: $\frac{1}{4}, \frac{2}{5}, \frac{3}{20}$

19. Write 420 as a product of prime numbers (find the prime factorization of 420). Hint: you might want to use a factor tree.

20. List the prime numbers that lie between 18 and 30.

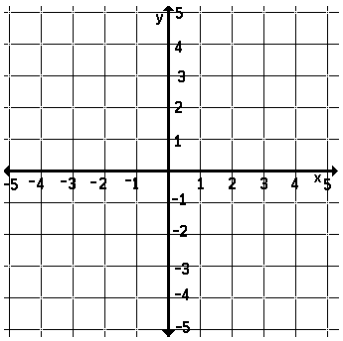
2. *Sketch the graph of a linear equation in two variables on a rectangular coordinate plane using the x- and y-intercepts and/or other ordered pairs.*

21. Plot the following points on the graph provided and label them on the graph using A, B, and C.
$A(-3,2)$, $B(-1,-4)$, $C(4,-4)$

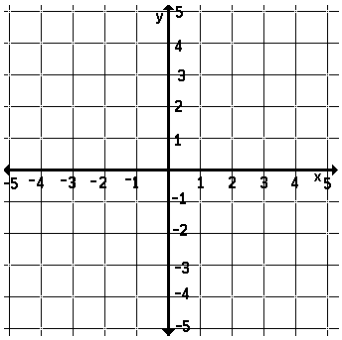


22. Complete the given table and then graph the equation $2x - y = 6$.

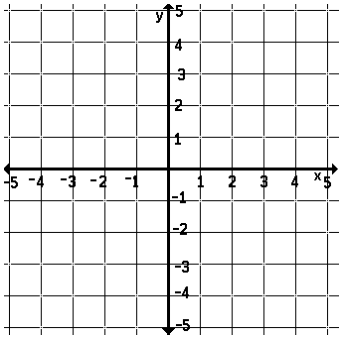
x	y
1	
	-2
4	



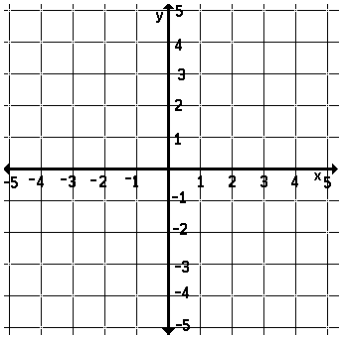
23. Graph $x - 2y = 4$ by finding and plotting its x-intercept and y-intercept.



24. Graph the linear equations $x = -3$ and $y = 1$ on the same set of axes below.



25. Graph the linear equation $y = -2x + 5$ by finding and plotting three ordered pair solutions.



3. ***Solve application problems involving whole numbers, integers, rational numbers, percents, proportions, and linear equations.***

26. Tim's four papers this quarter were graded at 42, 48, 50 and 64. Find his average (or mean) grade.

27. A carpenter has a piece of wooden trim that is $14\frac{1}{2}$ feet long. After he cuts a piece off that is $4\frac{3}{4}$ feet, how long is the remaining piece?

28. At a service station, 29 out of 50 drivers asked for a "fill-up." What percent of the drivers wanted a full tank of gas?

29. My neighbors told me they paid $26,550 as a down payment for their house and that amount was 15% of the price of the home. Find the price of their home.

30. 60% of students in Mr. Erickson's 8^{th} grade class eats the school lunch. If he has 30 students in this class, how many of them eat the school lunch? In other words: 60% of 30 is what number?

31. An airplane flies 1260 miles in 3 hours. How far will it fly in 5 hours?

32. In a sample of 85 batteries, three were found to be defective. At this rate, how many defective batteries should be found in a case of 5,100?

33. Last year three Americans were awarded a cash prize for work in Mechanics. They shared the prize money and received $183,050 each. What was the prize cash award before it was awarded?

34. During a research project, a diver inside a shark cage made observations at a depth of 125 feet. For a second set of observations, the cage was raised to a depth of 90 feet. How many feet was the cage raised between observations?

35. Find the total cost in buying a television selling for $800 if the sales tax rate is $6\frac{1}{2}\%$.

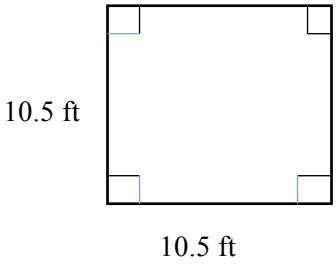
36. Six months before an election, a political candidate was 33 points behind in the polls. Two days before the election, polls showed that his support had skyrocketed; he found himself only 7 points behind. How much support had he gained over the six-month period?

37. A geologist weighed a rock sample at the site where it was discovered and found it to weigh $10\frac{5}{8}$ lb. Later, a more accurate digital scale in the laboratory gave the weight as 10.189 lb. What is the difference between the two measurements?

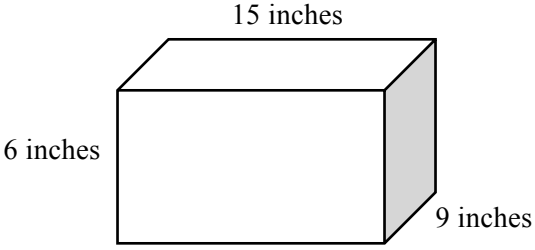
38. An accountant invested $78,000 at a simple interest rate of $3\frac{1}{2}\%$ for 4 years. How much interest was earned in 4 years? What was the total amount of money she will have after 4 years?

4. Calculate perimeter, area, and volume of common geometric figures.

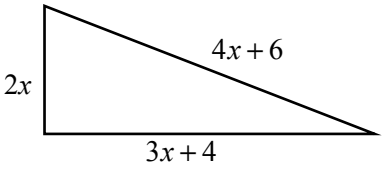
39a. How many square feet of carpeting are needed for a square room with sides measuring 10.5 feet?
39b. What is the perimeter of a square room with sides measuring 10.5 feet?



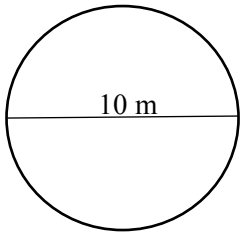
40. Find the volume of a box (in cubic inches) with length15 inches, width 9 inches, and height 6 inches.



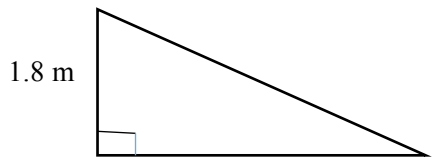
41. A triangle's three sides can be described as having lengths of 2x, 3x+4, and 4x+6. Write an expression that represents the perimeter of this triangle. Simplify the expression.



42. Find the exact and approximate circumference of a circle with a diameter of 10 meters. For the approximation, use 3.14 for pi.

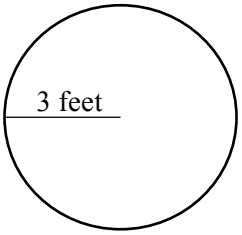


43. Find the area of a triangle with base 3.3 m and height 1.8 m.



3.3 m

44. Find the exact and approximate area of a circle with a radius 3 feet. For the approximation, use 3.14 for pi.



*5. **Convert between different units of measure.***

45. Convert 12 feet to yards.

46. Convert 2.5 miles to feet.

47. Find the area of a rectangular garden plot, in square inches, whose sides are 4 feet long and 6 inches wide.

48. Convert 8,000 pounds to tons.

49. Convert 10 days to minutes.

50. Convert 12 gallons to pints.

*6. **Simplify linear expressions utilizing the distributive property and combining like terms.***

51. Simplify $\left(5x^3+3x^2+4x\right)+\left(x^3-2x^2+6x\right)$

52. Simplify $8a+4-3a-6$

53. Simplify $\left(4x^2-6x+12\right)-\left(2x^2-3x+5\right)$

54. Simplify $4\left(n-2\right)+3$

55. Simplify $7-3(5-\mathrm{x})$

56. Evaluate $2t-3(t-s)$ for $t=-3$ and $s=5$

7. *Recognize the application of the field properties of the real numbers.*

57. True or False.

a. $3x+2=2+3x$ is demonstrating the Commutative Property of Addition

b. The Distributive Property says $5(x-2)=5x-2$

c. $8 \cdot 4 = 4 \cdot 8$ is an example of the Associative Property of Multiplication

d. The Identity Property of Addition says $a+0=a$

e. Four is a rational number.

f. 0, 2, and 17 are some examples of natural numbers.

g. Integers include all of the fractions.

h. π is an example of an irrational number.

8. *Utilize first-degree equations to solve application problems.*

58. The perimeter of a rectangle is 100 ft., with a width of x and a length of $5x$. Fill in the blank in the equation to create a full statement about the perimeter of the rectangle. $2 \cdot x + 2 \cdot \_\_\_\_ = 100$

59. Translate the sentence into an equation, then solve the equation. If 7 is subtracted from twice a number, the result is 5. Find the number.

60. Solve by defining a variable, writing an equation, and solving the equation. A 99-seat passenger plane has 10 times as many economy seats as first-class seats. Find the number of first-class seats.

61. Translate the sentence into an equation, then solve the equation. The difference of 30 and a number is equal to the product of 3 and the sum of the number and 6. Find the number.

62. Solve by defining a variable, writing an equation, and solving the equation. A shopper used some 30-cents-off coupons and some 20-cents-off coupons at the supermarket to get a reduction of $3.30 from her grocery bill. If she used a total of 14 coupons, how many of the 30-cents-off coupons did she redeem at the checkout stand?

63. Solve by defining a variable, writing an equation, and solving the equation. A telephone book has white pages and yellow pages. $\frac{3}{4}$ of the book consists of the white pages; the yellow pages number 300. What is the total number of pages in the telephone book?

9. *Calculate using the order of operations.*

64. Evaluate: a. 4^2 b. -4^2 c. $(-4)^2$ d. 5^3

e. -5^3 f. $(-5)^3$ g. x^3-2x^2+5x+6 for $x=-2$

65. Use order of operations to simplify each expression.

a. $\frac{1}{3}+\frac{1}{3}\cdot\frac{1}{4}$

b. $(-6-4)(-5)\div(-5)-(-10)$

c. $7-2\left(2^4-30+4\cdot\sqrt{64}\right)$

d. $\frac{2+3[4-(1-8)]}{|2(-8+2)+7|}$

10. ***Simplify square roots****.*

66. Simplify: $-\sqrt{196}$

67. Which two whole numbers is the $\sqrt{27}$ between?

68. Simplify: $2\cdot\sqrt{36}$

69. Simplify: $\sqrt{\frac{4}{25}}$

11. ***Solve first-degree equations.***

70. Solve the following equations.

a. $\frac{r}{16}=4$

b. $-n=11$

c. $x+17=-34$

d. $11x-3=0$

e. $8a+7=15$

f. $-7x-6=71$

h. $-0.6x-0.15=0.15$

i. $2x-\frac{1}{2}=\frac{2}{7}$

j. $-\frac{3}{16}y=\frac{3}{8}$

k. $11x=5x-3$

l. $2z+4=3z-5$

m. $\frac{y}{3}=\frac{y}{27}+\frac{1}{9}$

g. $0 = \frac{n}{3}$ n. $3(x-1)-12=0$

12. ***Solve a first-degree inequality in one variable and graph the solution on a number line graph.***

71. Graph each inequality on a number line.

a. $x \geq -3$ b. $x < -1$ c. $-3 < x < 4$

72. Solve the following inequalities. Graph the solution set.

a. $x-2 \geq -5$ b. $x+4 < 1$ c. $-3x \leq 6$ d. $4x+5 > 2x-9$

13. ***Utilize math specific note-taking techniques.***
14. ***Understand the importance of homework and utilize homework strategies specific to math.***
15. ***Utilize exam studying techniques and understand test anxiety.***
16. ***Understand and implement time management strategies.***
17. ***Learn how to use appropriate resources including on-campus and/or online.***

73. Multiple Choice. Which of the following are important strategies related to math homework?
a. Practice your HW a lot. The more time you spend solving mathematical problems, the easier the processes usually becomes.
b. Schedule enough time to complete HW assignments before their due date.
c. Check your HW answers. If you find you made a mistake, it's very important to figure out what went wrong and correct your mistake.
d. When you need help on HW it's a good idea not to erase your work. That way it will be easier for someone (your instructor, a tutor, or a classmate) to find where you had trouble.
e. All of the above.

74. True or False.
It's important in mathematics to keep up with homework because many concepts build upon each other. It's very common that in order for you to understand a new topic, you must understand previous material.

75. List at least four things you should do to study for the final exam.

76. Multiple Choice. When taking a quiz, test, or the final exam, which of the following should you do?
a. Carefully read the directions.
b. Carefully read each problem and make sure you are answering what has been asked.
c. Watch your time so you can pace yourself properly so you can get to all of the problems.
d. If you have extra time, instead of turning your test in early, go back and double check your work and answers.
e. All of the above.