

**Math 51 Exam #1 Review – Winter 2016**

**Please Note:** The exam will cover Chapters 1, 2, and 3. The review sheet is designed for you to have a guide as to what to study. The problems on the exam are not limited to the type of problems on this sheet. Any types of problem from the assigned homework problems are possible exam questions. Also, it is advisable to review the different sets of numbers and what type of numbers belong to each set, and the different properties of real numbers (i.e. commutative, associative, etc.) As a reminder, all applications will need to be solved using an equation. Please attempt other practice problems other than those presented on this sheet in order to be completely prepared for the exam.

1. Evaluate the following expressions.

a.  $\frac{6(3^2 - 1) + 8}{3 \cdot 2 - 2}$

b.  $3 + 2(4 - 8 \div 2) - (4 + 5[6 - 3]^2)$

c.  $2 + 18 \div 3 \cdot 2 - 5$

d.  $\frac{5}{3} + \frac{1}{6} - \frac{1}{2}$

e.  $2|5 - (-3)| - 4(3 - 6)^2$

2. Evaluate the following expressions if  $x = 3$ ,  $y = -2$ ,  $z = 5$

a.  $5x - 3y + 4z$

b.  $4x^2 - 2y$

c.  $-6x + 5y^2$

d.  $2x^2 - 4y^2 - z^2$

3. Solve the following equations.

a.  $4x + 6 = -(x - 2)$

b.  $\frac{3}{5}x - \frac{1}{10}x = x - \frac{5}{2}$

$$c. 11x - 5(x + 3) = 6x$$

$$d. 10(2x - 1) = 8(2x + 1) + 14$$

$$e. -\frac{5}{6}q - \left(q - \frac{1}{2}\right) = \frac{1}{4}(q + 1)$$

$$f. \frac{3x - 2}{5} = \frac{6x - 5}{11}$$

$$g. 4(x + 3) = 2(2x + 8) - 4$$

$$h. 8(t - 3) + 4t = 6(2t + 1) - 10$$

4. Perform the indicated operation.

$$a. -p + 10p - 3p - 4 - 5p$$

$$b. -3(2t + 4) + 8(2t - 4)$$

$$c. -2(3r - 4) - (6 - r) + 2r - 5$$

5. Simplify each of the following expressions.

$$a. (2x^2y^5)^5$$

$$b. \left(\frac{6x^3y^9}{z^5}\right)^4$$

$$c. \left(\frac{-2x^4y^{-2}z^{-3}}{3x^{-2}y^6z^{-4}}\right)^{-4}$$

$$d. \frac{(6r^{-1})^2(2r^{-4})}{r^{-5}(r^2)^{-3}}$$

$$e. \frac{(a^{-2}b^{-3}c^{-4})^{-5}}{(a^2b^3c^4)^5}$$

$$f. \frac{(x^{-1}y^2z)^{-2}}{(x^{-3}y^3z)^{-1}}$$

$$g. \frac{(x+2y)^{-3}}{(x+2y)^{-5}}$$

6. If 3 is added to a number and this sum is doubled, the result is 2 more than the number. Find the number.
7. Two times  $r$  subtracted from seven times the sum of  $r$  and one is equal to three times the difference of  $r$  and five.
8. The sum of three times a number and 7 more than the number is the same as the difference between -11 and twice the number. What is the number?
9. If 6 gallons of premium unleaded gasoline cost \$4.00, how much would it cost to completely fill a 15-gallon tank?
10. The sum of  $n$  and three subtracted from twelve times  $n$  is the same as negative eleven plus the product of 2 and the difference of  $n$  and five.
11. The largest drum ever constructed was played at the Royal Festival Hall in London in 1987. It had a diameter of 13 feet. What was the area of the circular face of the drum?
12. If sales tax on a \$16.00 compact disc is \$1.32, how much would the sales tax be on a \$120.00 compact disc player?
13. The distance between Singapore and Tokyo is 3300 miles. On a certain wall map, this distance is represented by 11 inches. The actual distance between Mexico City and Cairo is 7700 miles. How far apart are they on the map?
14. If 2 is subtracted from a number and this difference is tripled, the result is 4 more than the number. Find the number.
15. In one day Akilah Cadet received 13 packages. Federal Express delivered three times as many as Airborne Express, while United Parcel Service delivered 2 less than Airborne Express. How many packages did each service deliver to Akilah?
16. Find two consecutive even integers such that the smaller added to three times the larger gives a sum of 46.
17. If 6 is subtracted from the largest of three consecutive odd integers, with this result multiplied by 2, the answer is 23 less than the sum of the first and twice the second of the integers. Find the integers.

18. The sum of two consecutive integers is 137. Find the integers.
19. How many gallons of 50% antifreeze must be mixed with 80 gallons of 20% antifreeze to get a mixture that is 40% antifreeze?
20. How many gallons of a 12% indicator solution must be mixed with a 20% indicator solution to get 10 gallons of a 14% solution?
21. A coin collector has \$1.70 in dimes and nickels. She has 2 more dimes than nickels. How many nickels does she have?
22. At a given hour two steamboats leave a city in the same direction on a straight canal. One travels at 18 miles per hour and the other travels at 25 miles per hour. In how many hours will the boats be 35 miles apart?
23. St. Louis and Portland are 2060 miles apart. A small plane leaves Portland, traveling towards St. Louis at an average speed of 90 mph. Another plane leaves St. Louis at the same time, traveling toward Portland, averaging 116 mph. How long will it take them to meet?
24. 84 ft. of border strip was used to go around a rectangular room. The width of the room is 4 ft. less than the length. What are the dimensions?
28. After completing the trim on some kitchen cabinets, Candice has 48 in. of trim wood left. She decides to make a picture frame out of the wood. She wants to make the frame so that the length is 4 in. less than three times the width. What must the dimensions be?
26. With income earned by selling the rights to his life story, an actor invests some of the money at 3% and \$30,000 more than twice as much at 4%. The total annual interest earned from the investments is \$5600. How much is invested at each rate?
27. The selling price of a scientific calculator is \$15. If the markup is 25% of the dealer's cost, what is the dealer's cost of the calculator?
28. Hannah purchased a curio stand discounted 35%. If the sale price is \$246.68 what was the original price?
29. Trip goes to a bank and gets change for a \$50 bill consisting of all \$5 bills and \$1 bills. There are 22 bills in all. How many of each kind are there?