

Math 71 Exam #1 Review Sheet – Fall 2019

Please Note: The review sheet is designed for you to have a guide as to what to study. Exam #1 will cover chapters 1-3, and 4.1-4.2. The problems on the exam are not limited to the type of problems on this sheet. Any type 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. Please attempt other practice problems other than those presented on this sheet in order to be completely prepared for the exam.

1. Evaluate each of the following algebraic expressions for the given value or values of variable(s).

a. $8x - y$, for $x = 3$ and $y = 4$

b. $x^2 - 7x + 4$, for $x = 8$

c. $x^2 - 4(x - y)^2$, for $x = 8$ and $y = 3$

2. Use the order of operations to simplify the following expressions.

a. $8(-3) - 5(-6)$

b. $5(-3)^2 - 2(-2)^2$

c. $8^2 - 16 \div 2^2 \cdot 4 - 3$

d. $8 - 3[-2(5 - 7) - 5(4 - 2)]$

e. $15 - \sqrt{3 - (-1)} + 12 \div 2 \cdot 3 - |5 - (-2)|$

3. Simplify the following algebraic expressions.

a. $6x + 10x^2 + 4x + 2x^2$

b. $8(3x - 5) - 6x$

c. $4(5y - 3) - (6y + 3)$

d. $6 - 5[8 - (2y - 4)]$

e. $14x^2 + 5 - [7(x^2 - 2) + 4]$

4. Solve each of the following linear equations.

a. $3x + 8 = 50$

b. $25 - 6x = -83$

c. $5x - 2 = 9x + 2$

d. $3(x - 2) + 7 = 2(x + 5)$

e. $3(x - 4) - 4(x - 3) = x + 3 - (x - 2)$

f. $7(x + 1) = 4[x - (3 - x)]$

g. $\frac{x}{5} = \frac{x}{6} + 1$

h. $2x - \frac{2x}{7} = \frac{x}{2} + \frac{17}{2}$

i. $\frac{x + 1}{4} = \frac{1}{6} + \frac{2 - x}{3}$

j. $\frac{3x}{5} - \frac{x - 3}{2} = \frac{x + 2}{3}$

5. Simplify the following algebraic expressions.

a. $3x^5 \cdot 4x^6$

b. $(4x^5y^6)(20x^7y^3)$

c. $\frac{-55a^5b^3c^8}{5a^3b^7c^2}$

d. $\frac{30x^2y^{13}}{-6x^5y^{-2}}$

e. $\left(\frac{-15a^4b^2}{5a^{10}b^{-3}}\right)^3$

$$f. \left(\frac{4a^{-5}b^3}{12a^3b^{-5}} \right)^{-3}$$

6. Solve each formula for the specified variable.

a. $A = lw$ for w .

b. $T = D + pm$ for p .

c. $y - y_1 = m(x - x_1)$ for m .

d. $s = \frac{1}{2}at^2 + vt$ for v .

7. When two times a number is decreased by 3, the result is 11. What is the number?

8. When a number is decreased by 30% of itself, the result is 28. What is the number?

9. 70% of what number is 252?

10. One number exceeds another by 24. The sum of the numbers is 58. What are the numbers?

11. In a triangle, the measure of the first angle is twice the measure of the second angle. The measure of the third angle is 20° less than the second angle. What is the measure of each angle?

12. You are choosing between two plans at a discount warehouse. Plan A offers an annual membership fee of \$300 and you pay 70% of the manufacturer's recommended list price. Plan B offers an annual membership fee of \$40 and you pay 90% of the manufacturer's list price. How many dollars of merchandise should you have to purchase in a year to pay the same amount under both plans? What will be cost for each plan?

13. 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?

14. A rectangular soccer field is twice as long as it is wide. If the perimeter of the soccer field is 300 yards, what are its dimensions?

15. A rectangular pool is 6 meters less than twice the width. If the pool's perimeter is 126 meters, what are its dimensions?

16. Find the slope, x -intercept and y -intercept of the following linear functions.

a. $y = \frac{2}{3}x - \frac{3}{4}$

b. $5x - 4y = 20$

17. Determine the equation of the following lines based on the given information. Remember to leave your answer in *slope-intercept form*.

- a. Find the equation of a line that is parallel to $x + 2y = 6$ and passing through the point $(3, 7)$.
- b. Find the equation of a line that is perpendicular to $3x + 4y = 5$ and passing through the point $(3, -2)$.
- c. Find the equation of a line passing through the points $(3, 4)$ and $(6, 2)$.
- d. Find the equation of a line with a slope of $\frac{2}{3}$ and passing through the point $(1, 5)$.
- e. Find the equation of a vertical line that passes through the point $(3, 2)$.
- f. Find the equation of a horizontal line that passes through the point $(-2, 5)$.

18. Given the following functions.

$$f(x) = 4x - 2, \quad g(x) = 3x^2 - 5x + 6, \quad h(x) = 2x - 7$$

Evaluate:

- a. $f(2)$
- b. $g(1)$
- c. $(f + g)(x)$
- d. $(f - h)(2)$
- e. $\left(\frac{f}{h}\right)(1)$
- f. $f(x - 3)$
- g. $(f \cdot g)(-3)$
- h. $(f - g)(x)$

19. Given the following functions.

$$f(x) = \frac{5}{x-4}, \quad g(x) = \frac{2x+5}{x+3}$$

Determine the following:

- a. Domain f
- b. Domain g
- c. Domain $(f + g)$
- d. Domain $(f - g)$

20. Solve the following system of equations. Remember that you will need to know how to use the graphing, substitution, and elimination methods.

$$a. \begin{cases} x - 2y = 16 \\ y + 3 = 3x \end{cases}$$

$$b. \begin{cases} x - 3y = -6 \\ 3x - 9y = 9 \end{cases}$$

$$c. \begin{cases} 2x + 6y = 8 \\ 3x + 9y = 12 \end{cases}$$

$$d. \begin{cases} 3x - 5y = 11 \\ 2x - 6y = 2 \end{cases}$$

21. Alvin paddled for 4 hr with a 6-km/h current to reach a campsite. The return trip against the same current took 10 hr. Find the speed of Alvin's canoe in still water.

22. Casella's Catering is planning a wedding reception. The bride and groom would like to serve a nut mixture containing 25% peanuts. Casella has available mixtures that are either 40% or 10% peanuts. How much of each type should be mixed to get a 10-lb mixture that is 25% peanuts?

23. Two Quarter Pounders and three Whoppers with cheese provide 2607 calories. One of each provides 9 calories in excess of what is allowed on a 1000 calorie-a-day diet. Find the calories in each item.

24. A grocer needs to mix tea worth \$6.00 per pound with tea worth \$8.00 per pound to obtain 144 pounds of a tea mixture worth \$7.50 per pound. How many pounds of each kind of tea must be used?

25. A rectangular lot whose perimeter is 360 feet is fenced along three sides. An expensive fencing along the lot's length cost \$20 per foot, and an inexpensive fencing along the two side widths costs only \$8 per foot. The total cost of the fencing along the three sides comes to \$3280. What are the lot's dimensions?

26. Water freezes at 0°C which corresponds to 32°F . Water boils at 100°C which corresponds to 212°F . Find a linear equation for this relation and use this equation to find the Celsius measure of 70°F .

27. Rick's cellular phone cost him \$70 to purchase and activate. After 4 months, his total cost for the phone is \$190. Predict Rick's total cost for the phone after 9 months.

28. Solve the following inequalities. Write the solution set in interval notation.

a. $5x+1 \geq 3x-9$

b. $4x-(6x+1) \leq 8x+2(x-3)$

c. $-w+12+9w > w+9+w$

d. $2(x-5)+3x < 4(x-6)+1$

e. $5 < 1-6m < 12$

f. $-7 \leq 3x-4 \leq 8$

g. $2 < 6 + \frac{3}{4}x \leq 12$

h. $-12 \leq \frac{3}{7}x+2 < -4$

29. Solve the following inequalities.

a. $6-5x > 1-3x$ and $4x-3 > x-9$

b. $3 \leq 4x-3 < 19$

c. $3x+2 \leq 5$ or $5x-7 \geq 8$

d. $4x+3 < -1$ or $2x-3 \geq -11$

e. $5(x-2) > 15$ and $\frac{x-6}{4} \leq -2$