

**Choose ONE of the problems on this list to solve in the discussion this week. Please start a new thread and post the problem number in the subject line.**

1) Solve the equation and show the check of the answer:

$$-6 - 2(x + 3) = 2(-3x + 6)$$

2) Solve the equation by clearing decimals first, and show the check of the answer:

$$4.75n - 3.5 = 4.4 + 0.8n$$

3) Solve the equation by clearing fractions first, and show the check of the answer:

$$x + \frac{5}{7} = \frac{10}{7}x + \frac{46}{35}$$

4) Solve the inequality, write the solution set in interval notation, and graph the solution set on a number line:

$$6 - 5(8y - 5) \leq -(1 + 8y)$$

5) Solve the inequality by clearing fractions first, write the solution set in interval notation, and graph the solution set on a number line:

$$-\frac{6}{5}x + \frac{5}{4} < \frac{73}{20}$$

6) Solve the compound inequality, write the solution set in interval notation, and graph the solution set on a number line:

$$29 < 1 - 7w \leq 43$$

7) Solve the compound inequality by clearing fractions first, write the solution set in interval notation, and graph the solution set on a number line:

$$-\frac{3}{4} \leq -\frac{3}{4}a < \frac{45}{16}$$

8) Find at least four ordered pairs that satisfy the equation  $5x + 2y = 20$ . Plot the ordered pairs and sketch the line through them on a coordinate system.

9) Write an equation in point-slope form of the line through the point  $(5, -7)$  parallel to the line with equation  $2x - 3y = 6$ . Graph both lines on one set of coordinate axes.

10) Write an equation in standard form of the line through the point  $(-5, -2)$  perpendicular to the line with equation  $9x + 2y = -5$ . Graph both lines on one set of coordinate axes.

11) Simplify the expression. Your answer should contain only positive exponents:

$$(4m^3n^5)(3nm^4)(3nm^3)$$

12) Simplify the expression. Your answer should contain only positive exponents:

$$(-4x^{-3}y^{-2})^4$$

13) Simplify the expression. Your answer should contain only positive exponents:

$$\frac{-4x^4y^{-3}}{(-3x)(-4yx^{-4})}$$

14) Perform the indicated operations and simplify:

$$(7x^4 - 7x^3 - 5) - (2x^4 + 5x^3 - 4)$$

15) Perform the indicated operations and simplify:

$$(8n-3)(7n^2+5n-5)$$

16) Factor the following expressions, using the methods discussed in Chapter 6 of our textbook:

a)  $x^2 - 5x - 50$

b)  $8n^2 + 30n + 25$

17) Solve the equation by the method of factoring:

$$10k^2 - 37k + 7 = 0$$

18) Solve the equation by the method of factoring:

$$14x^2 = 18 - 36x$$

19) Solve the equation by the method of completing the square:

$$a^2 - 12a - 28 = 0$$

20) Solve the equation by the method of completing the square:

$$4a^2 + 11a + 6 = 9$$

21) Solve by use of the Quadratic Formula:

$$2n^2 + 4n = 5$$

22) Solve by use of the Quadratic Formula:

$$3x^2 = -10x - 8$$

23) Simplify the rational expression and state the excluded values:

$$\frac{r^2 - 2r - 15}{r^2 - 9}$$

24) Simplify the rational expression and state the excluded values:

$$\frac{5x^2 + 43x - 18}{8x + 72}$$

25) Solve the equation by clearing fractions first. Check all potential answers in the original equation and identify any extraneous solutions.

$$\frac{k-4}{k-1} - \frac{k+1}{k^2-5k+4} = \frac{k+6}{k^2-5k+4}$$

26) Simplify the radical expressions. Assume that all variables represent non-negative real numbers.

a)  $\sqrt{125m^4p^3n^9}$

b)  $\sqrt[3]{64x^8y^{24}}$

27) Solve the radical equation and check all answers:

$$n = 6 + \sqrt{4n - 28}$$

28) The distance an object falls varies directly as the square of the time that it is falling. If an object falls 64 feet in two seconds, how far does the object fall in three seconds?

29) A person's weight varies inversely as the square of the person's distance from the center of the Earth. If an astronaut weight 125 pounds on the surface of the Earth, how much will she weigh 150 miles above the surface of the Earth? Assume that the radius of the Earth is 4000 miles, and round your answer to the nearest tenth of a pound.

30) Brenda would like to have at least \$300,000 saved for her daughter's college education. If she invests \$92,000 in an education account paying 7.15% interest compounded monthly, will she reach her goal in 18 years? Show all work to justify your answer and include appropriate units.

31) The number of Apple stores in the world has been steadily increasing. In 2009, there were 273 Apple stores worldwide. By 2014, that number had increased to 437 stores. Let  $y$  be the number of Apple stores worldwide in the year  $x$ , where  $x = 0$  represents the year 2009.

a) Write a linear equation in slope-intercept form that models the growth in the number of Apple stores worldwide in terms of  $x$ . [Hint: the line must pass through the points (0, 273) and (5, 437)].

b) Use this equation to predict the number of Apple stores worldwide in the year 2020. Round to the nearest whole number if necessary.

c) Explain what the slope for this line means in the context of the problem.

32) Amy left work and drove toward the lake. Gabriella left work one hour later, driving 15 mph faster, in an effort to catch up with Amy. After two hours, Gabriella finally caught up with Amy. How fast was each woman driving?