

Directions:

Show complete work on *separate paper*. Write in pencil, show all steps and clearly box your final answer. If you experience difficulty, contact Mr. Weisner (bdweisner@smcps.org) at any time during the summer. Bring your completed work to class on the first day of school.

Do NOT use a calculator!

Lines

1. Find the slope of the line given: (-2, 7) and (4, 7). What type of line has the found slope?
2. Given the points (9, -4) and (x, 8), find the value of x if the slope of the line connecting the points is 2.5.
3. Find the slope of the line which is perpendicular to the line $7x - y + 8 = 0$.
4. Find all intercepts of the line $-5x + y = 14$.
5. Find an equation of the line which has an x-intercept of -3 and a y-intercept of 2.

Multiplying: Multiply the following expressions and write your answer in simplest form.

6. $(x - 3)(5 - 2x + 7x^2)$
7. $(3x - 5)^2$
8. $\frac{x^2 - 4}{x + 3} \cdot \frac{x^2 + 4x + 3}{2x - 4}$
9. $(4 - \sqrt{x})(4 + \sqrt{x})$
10. $\frac{3x - 8}{x^2 - 3x + 2} \div \frac{3x - 6}{x - 1}$

Factoring: Solve the following equations for all possible solutions (roots, x-intercepts, or zeros).

11. $x^2 + 6x + 9 = 0$
12. $x^2 + 4x = 21$
13. $3x^2 - x - 2 = 0$
14. $(x - 8)^2 + 3 = 9$
15. $2x^3 - 8x^2 - 10x = 0$

Fractions: Perform the operation and simplify the following fractions into its simplest form.

16. $\frac{5}{7} - \frac{4}{3}$
17. $\frac{11}{x} + 2$
18. $\frac{5}{2 + x} + \frac{3}{x - 1}$
19. $\frac{6}{x + 3} - \frac{9}{x - 3}$
20. $\frac{x - 1}{x + 1} - \frac{x + 2}{x - 2}$

Exponents/Logarithms: Simplify the following expressions.

21. $\sqrt[3]{-8}$

22. $\left(\frac{1}{16}\right)^{\frac{1}{4}}$

23. $\ln e^6$

24. $\log_8 16$

25. $(4e^{-11}f^0g)^{-2}$

Equations: Solve the equations for the indicated variable

26. Solve for x : $-2(4 + 3x) = 3(x - 2)$

27. Solve for P : $A = P + Prt$

28. Solve for y : $3\left(\sqrt[3]{2y + 6}\right) - 4 = -3$

29. Solve for x : $2\log 3x = 4$

30. Solve for x : $\frac{x}{x+3} + \frac{2}{x} = \frac{5}{2x}$

Functions: Use the following for problems 31-35.

$$f(x) = 2x - 3$$

$$g(x) = 2x^2 - 7x + 3$$

Apply function operations and simplify if possible

31. $(f + g)(x)$

32. $f(-3)$

33. $g(f(x))$

34. $g(x) \div f(x)$

35. $f^{-1}(x)$ (this is inverse notation)