Mr. Rivera **Summer Assignment – Pre-Calculus** **Pages 1-5**

Short Answer

Solve the equation.

1. $\frac{1}{4}r - \frac{1}{16} + \frac{1}{2}r = \frac{1}{2} + r$

2. $-5y - 9 = -(y - 1)$

3. $|3x + 5| = 1$

4. $\sqrt{x + 10} - 7 = -5$

5. $4(3 - x)^{\frac{4}{3}} - 5 = 59$

Solve for *x*. State any restrictions on the variables.

6. $ax + bx + 9 = 7$

7. $a(bx + 2) = cx - 12$

Solve the compound inequality. Graph the solution set.

8. $5x + 10 \geq 10$ and $7x - 7 \leq 14$

9. $-2 \leq 2x - 4 < 4$

10. For $f(x) = 5x + 1$, find $f(-4)$.

11. Suppose $f(x) = 4x - 2$ and $g(x) = -2x + 1$.
Find the value of $\frac{f(5)}{g(-3)}$.

Find the slope of the line through the pair of points.

12. (6, 12) and (–6, –2)

Find the slope of the line.

13. $y = -\frac{1}{2}x - 4$

Find an equation for the line:

14. through (2, 6) and perpendicular to $y = -\frac{5}{4}x + 1$.

15. through (–4, 6) and parallel to $y = -3x + 4$.

16. What is the vertex of the graph of the function $y = |-3x + 2| - 4$?

Write an equation for the vertical translation.

17. $y = \frac{2}{3}x$; 4 units down

18. Write the equation that is the translation of $y = |x|$ left 1 unit and up 2 units.

Solve the system by the method of substitution.

19. $\begin{cases} 5x - y = 5 \\ 5x - 3y = 15 \end{cases}$

20. Identify the vertex and the *y*-intercept of the graph of the function $y = -3(x + 2)^2 + 5$.

Factor the expression.

21. $x^2 + 14x + 48$

22. $x^2 - 6x + 8$

23. $x^2 - 2x - 63$

24. Simplify $\sqrt{-175}$ using the imaginary number *i*.

Write the number in the form *a* + *bi*.

25. $\sqrt{-4} + 10$

Simplify the expression.

26. $(-1 + 6i) + (-4 + 2i)$

Use the Quadratic Formula to solve the equation.

27. $5x^2 + 9x - 2 = 0$

28. Write a polynomial function in standard form with zeros at 5, –4, and 1.

Multiply and simplify if possible.

29. $\sqrt{6} \cdot \sqrt{2}$

30. $\sqrt{7x}\left(\sqrt{x} - 7\sqrt{7}\right)$

Simplify the expression.

31. $20^{\frac{1}{2}} \cdot 20^{\frac{1}{2}}$

32. $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$

33. $8^{\frac{4}{3}}$

34. $\frac{8}{\sqrt{6} - \sqrt{3}}$

35. $-\sqrt{5} - 3\sqrt{36} + 6\sqrt{5}$

36. Let $f(x) = -3x - 6$ and $g(x) = 5x + 2$. Find $f(x) + g(x)$.

37. Let $f(x) = 3x + 2$ and $g(x) = 7x + 6$. Find $f \cdot g$ and its domain.

Evaluate the logarithm.

38. $\log_5 \frac{1}{625}$

39. log 0.01

40. Write an equation for the translation of $y = \frac{4}{x}$ that has the asymptotes $x = 7$ and $y = 6$.

Simplify the complex fraction.

41. $\dfrac{\frac{3}{4y} - \frac{2}{y}}{\frac{1}{y} + \frac{3}{2y}}$

Solve the equation. Check the solution.

42. $\frac{-2}{x + 4} = \frac{4}{x + 3}$

Write the measure in radians. Express the answer in terms of π.

43. 45°

44. Suppose $\tan\theta = \frac{8}{15}$. Find $\cot\theta$.

Rationalize the denominator of the expression. Assume that all variables are positive.

45. $\frac{\sqrt{6x^8y^9}}{\sqrt{5x^2y^4}}$

46. $\dfrac{\sqrt{3}-\sqrt{6}}{\sqrt{3}+\sqrt{6}}$

47. $\dfrac{2+\sqrt[3]{3}}{\sqrt[3]{6}}$

Multiply.

48. $\left(-5-\sqrt{3}\right)^2$

49. $\left(8-\sqrt{2}\right)\left(9+\sqrt{5}\right)$

50. $\left(\sqrt{7}+\sqrt{10}\right)\left(\sqrt{7}-\sqrt{10}\right)$

51. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

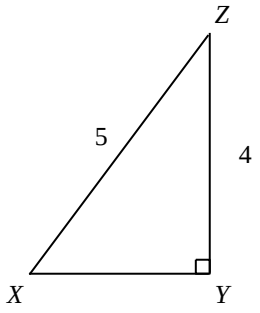
52. Write the radical expression $\dfrac{8}{\sqrt[7]{x^{15}}}$ in exponential form.

53. Let $f(x) = x^2 + 2x - 1$ and $g(x) = 2x - 4$. Find $2f(x) - 3g(x)$.

54. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.

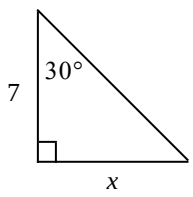
55. Let $f(x) = x^2 + 6$ and $g(x) = \dfrac{x+8}{x}$. Find $\left(g \circ f\right)(-7)$.

56. In ΔXYZ, $\angle Y$ is a right angle and $\sin X = \dfrac{4}{5}$. Find sin Z in fraction and in decimal form. Round to the nearest hundredth, if necessary.



Find the value of *x*. Round your answer to the nearest tenth.

57.



Not drawn to scale

58. Find $|-5-4i|$.

59. **Write the standard form of the equation of the circle with radius r and center (h, k).**

r = 3; (h, k) = (6, -6)

Graph the absolute value equation.

60. $y = |x + 4|$