54 points

ALL work MUST be shown and completed on loose-leaf. Do not show any work on this handout that you want graded. Problems are to be completed neatly and in order. #12's graph is to be completed on graph paper. I will not mark an answer correct unless it has the work to go along with it. Be sure to simplify all answers completely or it will not be marked correct. CIRCLE ALL ANSWERS PLEASE © DUE ON WEDNESDAY, 11/7. (there are NO exceptions to this due date!!)

1.) Solve each. Simplify your answers completely. (2 pts each)

a.) $\frac{5x+1}{2x+5} - \frac{x-2}{3x-4} - 2 = \frac{x^2-2}{6x^2+7x-20}$ b.) $3x - 16\sqrt{x} + 5 = 0$ c.) $\frac{3}{x^2+x} - \frac{4x}{x} = \frac{6}{x+1}$ d.) $2x^2 + 4x - 9 = 4(x-1)^2$ e.) $\frac{2}{3}(3x-6) - \frac{1}{2}(3x+5) = 4 - \frac{1}{4}(x-5)$

2.) Simplify each completely. (2 pts each)

a.)
$$\sqrt{50} - \frac{7}{\sqrt{2}} - \sqrt{\frac{1}{2}}$$
 b.) $(3\sqrt{x} - 4\sqrt{y})(4\sqrt{x} + 3\sqrt{y})$ c.) $\frac{55}{\sqrt{20}-3}$

d.)
$$\frac{\left(\frac{3}{x} - \frac{1}{4}\right)}{\left(\frac{12}{x} - 1\right)}$$
e.) $p - 4\left(\frac{1}{3}p - 2q\right) + \frac{1}{6}(2p + 5) - \frac{1}{2}q$ f.) $\left(\frac{2p^{-5}q^{-3}r^2}{3p^6q^{-5}r^{-4}}\right)^{-3} \cdot \frac{(6p^{-3}q^2)^0}{(-2p^{-3}q^2r^3)^{-3}}$

3.) Solve. -3|2x + 15| - 2 < -12 (2 pts)

4.) Find: a) the distance between the points (-3, ½) and (2, -5) (1 pt)

b) the midpoint of the line segment with endpoints $(-3, \frac{1}{2})$ and (2, -5) (1 pt)

5.) Find the x and y intercepts of each function. (2 pts each) a) $y = 9x^2 - 6x - 11$ b) f(x) = |2x - 1| - 4 c) $y = \sqrt{3x + 4} + 2$ d) 3x - 5y = 9

6.) Write the equation of the line in slope-intercept form that contains the points $\left(\frac{1}{2}, -7\right)$ and $\left(3, -\frac{3}{4}\right)$ (2 pts)

7.) Write the equation of the line in slope-intercept form that passes through the point (-4, 2) and is perpendicular to the line with equation -5x + 2y = 8. (1 pt)

8.) Given $f(x) = -2x^2 - 4x + 17$ evaluate $f(-\frac{2}{7})$ (1 pt)

9.) State the domain of each. (1 pt each)

a.) $f(x) = \sqrt[3]{x-3}$ b.) $g(x) = \sqrt{4-x^2}$ c.) $h(x) = \frac{3x}{x^2-2x-3}$ d.) $\{(-2, 5), (3, 6), (8, 0)\}$

10.) Find the zeros of each. (2 pts each)

a.) $f(x) = \sqrt{3x + 7} - \sqrt{x + 6} - 1$ b.) $\frac{12x^2 + 4x - 8}{3x^2 + x - 2}$

11.) Suppose $l_1 \perp l_2$ and $l_2: 6x - 2y = 11$. If l_1 passes through (a – 3, 7) and (- 2, 2a + 1), find the value of a. (2 pts)

12.) State each transformation of the graph of $f(x) = x^2$ to the graph of $g(x) = -\frac{1}{2}(x-3)^2 + 1$ Then, graph g(x) on graph paper. (3 pts)

13.) Find the difference quotient of $f(x) = -2x^3 + 13x - 2$ (3 pts)