Quiz 3: Solving equations and Inequalities

Name_____ *Solution 2/18/14*

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the real zeros, if any, of each quadratic function using the quadratic formula. List the x–intercepts, if any, of the graph of the function.

1) $f(x) = 6x^2 - 13x - 15$

    A) $x = -5, x = 3$ B) $x = -\frac{5}{3}, x = 6$ C) $x = \frac{5}{6}, x = -3$ D) $x = -\frac{5}{6}, x = 3$

1) __D__

Find the real zeros of the function. List the x–intercepts of the graph of the function.

2) $F(x) = x^4 - 5x^2 + 4$

    A) $x = -5, x = 5$ B) $x = -2, x = 2$
    C) $x = -4, x = 4$ D) $x = -1, x = 1, x = -2, x = 2$

2) __D__

$y^2 - 5y + 4$

$(y - 4)(y - 1)$

$y = 4 \quad y = 1$

3) $P(x) = (4x - 6)^2 + 6(4x - 6) + 5$

    A) $x = \frac{5}{4}, x = \frac{1}{4}$ B) $x = -\frac{5}{4}, x = -\frac{1}{4}$ C) $x = -\frac{7}{6}, x = \frac{11}{4}$ D) $x = \frac{7}{4}, x = -\frac{11}{4}$

3) __A__

$t^2 + 6t + 5 = (t + 5)(t + 1) = 0 \qquad t = -5 \therefore 4x - 6 = -5$

$x = \frac{1}{4}$

Solve the problem.

4) An open box is to be constructed from a square sheet of plastic by removing a square of side 4 inches from each corner, and then turning up the sides. If the box must have a volume of 1600 cubic inches, find the length of one side of the open box.

    A) 19 in.   B) 24 in.   C) 20 in.   D) 28 in.

4) __C__

$4x^2 = 1600$

$x^2 = 400 \quad x = 20$

Solve the inequality.

5) $x^2 - 2x - 15 \le 0$

    A) $(-\infty, -3]$ or $[5, \infty)$ B) $[-3, 5]$
    C) $[5, \infty)$ D) $(-\infty, -3]$

5) __B__

$(x - 5)(x + 3) \le 0$

6) $x^2 - 3x \ge 0$

    A) $[0, 3]$ B) $(-\infty, 0]$ or $[3, \infty)$
    C) $(-\infty, -3]$ or $[0, \infty)$ D) $[-3, 0]$

6) __B__

$x^2 - 3x = 0$

$x(x - 3) = 0$

Find the complex zeros of the quadratic function.

7) $G(x) = x^2 + 100$

    A) $x = -10i, x = 10i$ B) $x = 10$ C) $x = -10, x = 10$ D) $x = 10i$

7) __A__

Solve the equation.

8) $|x + 6| - 4 = 12$

    A) {14, 10}   B) {-2, 10}   C) {-10, 10}   D) {-22, 10}

8) __D__

$|x + 6| = 16$

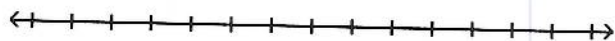$x + 6 = 16 \qquad$ or $\qquad x + 6 = -16$

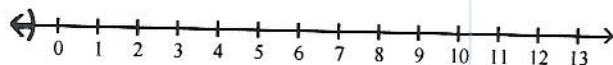$x = 10 \qquad\qquad\qquad x = -22$

Solve the inequality. Express your answer using interval notation. Graph the solution set.
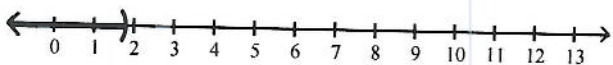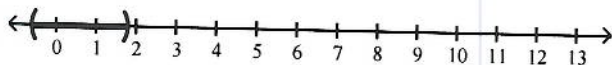
9) $|5k - 3| + 4 < 10$

A) $(-\infty, -\frac{3}{5})$

B) $(-\infty, \frac{9}{5})$

C) $(-\infty, -\frac{3}{5}) \cup (\frac{9}{5}, \infty)$

D) $(-\frac{3}{5}, \frac{9}{5})$

$|5k - 3| < 6$

$-6 < 5k - 3 < 6$

$-3 < 5k < 9$

$-\frac{3}{5} < k < \frac{9}{5}$

9) **D**

Solve the equation.

10) $|x| = 4$

A) {-4, 4}   B) {16}   C) {4}   D) {-4}

10) **A**

2.6 Solving Inequalities

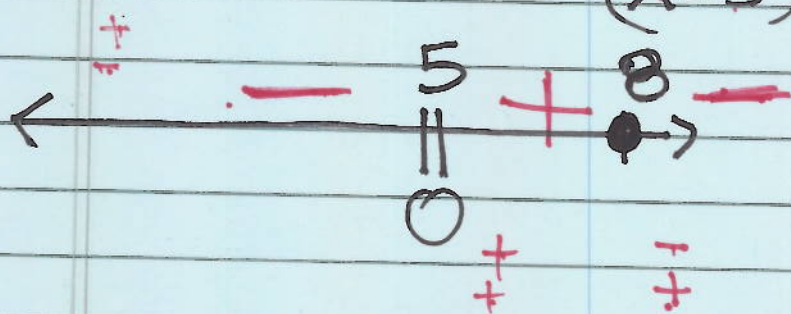Solve $\dfrac{2x-7}{x-5} \leq 3$

$\boxed{X \neq 5}$

$\downarrow$

$$\dfrac{2x-7}{x-5} - 3 \leq 0$$

$$\dfrac{2x-7-3x+15}{x-5} \leq 0$$

$$\dfrac{(-x+8)}{(x-5)} \leq 0$$

Solution
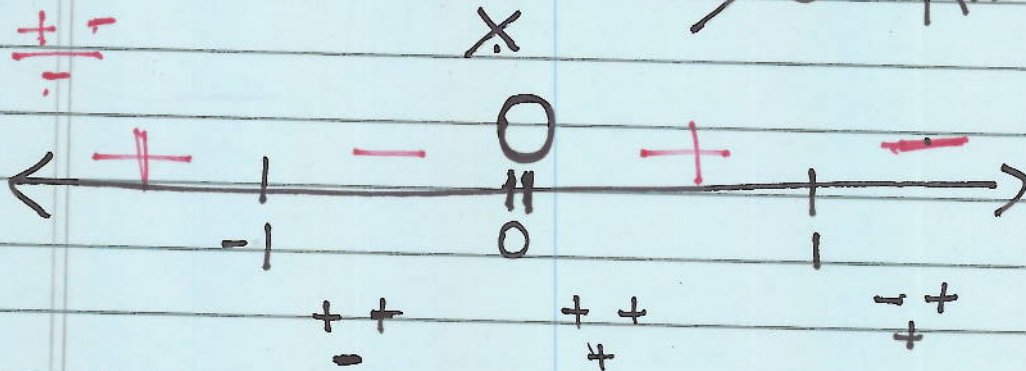
$$(-\infty, 5) \cup [8, \infty)$$

p220

(#81)

$\boxed{X \neq 0}$

$$\frac{1}{x} - x > 0$$

$$\downarrow$$

$$\frac{1 - x^2}{x} > 0$$

$$\frac{(1-x)(1+x)}{x} > 0 \qquad \text{Ans } (-\infty, -1) \cup (0, 1)$$

$\frac{+ \cdot -}{\cdot -}$

Domain of $f(x) = \sqrt{x^2 - 4}$

(#91)

$$x^2 - 4 \geq 0 \qquad \Big| \quad \sqrt{x^2} \geq \sqrt{4}$$

$$(x-2)(x+2) \geq 0 \qquad \Big| \quad |x| \geq 2$$

$X \leq -2 \text{ or } X \geq 2$

$(-\infty, -2] \cup [2, \infty)$

(#92) $f(x) = \sqrt[4]{4 - x^2}$ $\qquad 4 - x^2 \geq 0 \qquad 4 \geq x^2$

$D = [-2, 2] \qquad -2 \leq X \leq 2 \qquad \boxed{|x| \leq 2} \qquad 2 \geq |x|$

(#134)

$$12x^3 - 20x^2 < 0$$

$$4x^2(3x-5) < 0$$

this is always positive

then $3x-5$ is the one responsible for the sign.

$$3x - 5 < 0$$
$$3x < 5$$
$$x < \tfrac{5}{3}$$

$x < \tfrac{5}{3}$ But $x \neq 0$.

Solution $\left(-\infty, 0\right) \cup \left(0, \tfrac{5}{3}\right)$.