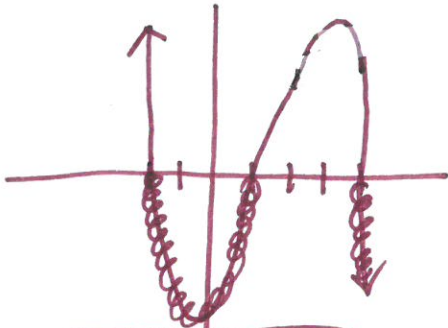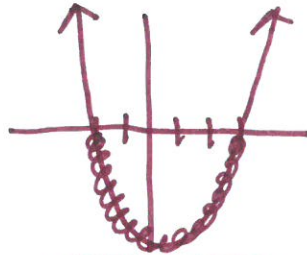Name: _____Key_____
Date: _____ Period: _____

Solve the inequality, and express the solutions in terms of intervals whenever possible.

1. $(x+2)(x-1)(4-x) \leq 0$

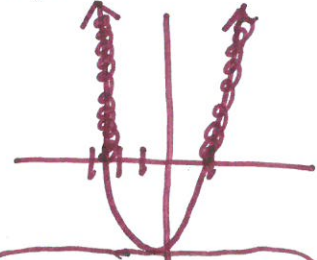$-2 \leq X \leq 1$ or $X \geq 4$
$-or-\ [-2,1] \cup [4,\infty)$
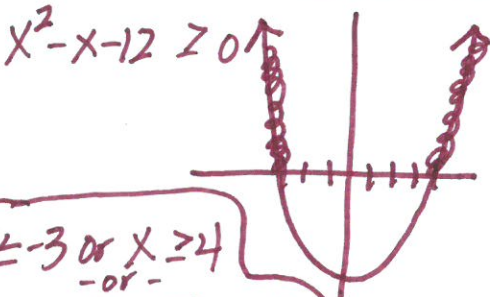
2. $x^2 - x - 6 < 0$

$-2 < X < 3$
$-or-(-2,3)$

3. $x(2x + 3) \geq 5$

$2x^2 + 3x - 5 \geq 0$

$X \leq -2.5$ or $X \geq 1$
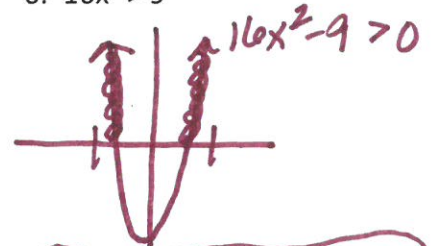$-or-\ (-\infty, -2.5] \cup [1, \infty)$

4. $x + 12 \leq x^2$

$X^2 - X - 12 \geq 0$

$X \leq -3$ or $X \geq 4$
$-or-$
$(-\infty, -3] \cup [4, \infty)$

5. $25x^2 - 9 < 0$

$-.6 < X < .6$
$- or -$
$(-.6, .6)$
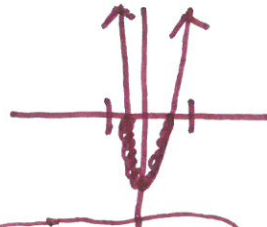
6. $16x^2 > 9$

$16x^2 - 9 > 0$
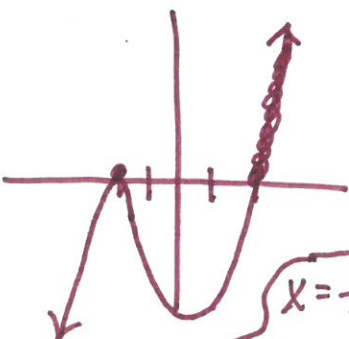
$X < -.75$ or $X > .75$
$-or-$
$(-\infty, -.75) \cup (.75, \infty)$

7. $x^3 + 2x^2 - 4x - 8 \geq 0$

$X = -2$ or $X \geq 2$
$- or-$
$\{-2\} \cup [2, \infty)$
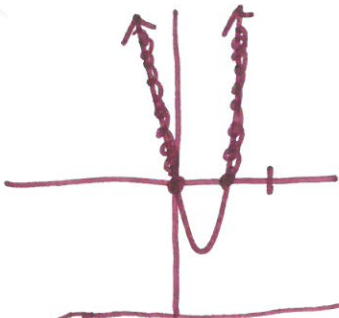
8. $\frac{(x^2+1)(x-3)}{x^2-9} \geq 0$

$x^2 + 1 > 0 \}$ already

$\frac{(x-3)}{(x-3)(x+3)} \geq 0$

$\frac{1}{X+3} \geq 0$

$X + 3 > 0 \ \{can't = 0\ so\ X \neq -3\}$ or 3

$X > -3, X \neq -3; X \neq 3$
or
$(-3, 3) \cup (3, \infty)$

9. $\frac{(x+5)}{x^2-7x+12} \leq 0$

$\frac{X+5}{(X-3)(X-4)} \leq 0$

$\checkmark \quad X \quad \checkmark \quad X$
$-5 \qquad 3 \quad 4$

$X \leq -5$ or $3 < X < 4$
$-or-$
$(-\infty, -5] \cup (3, 4)$

10. $16x^2 \geq 9x$

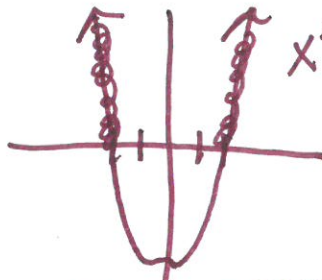$16x^2 - 9x \geq 0$

$x \leq 0$ or $x \geq .5628$

-or-

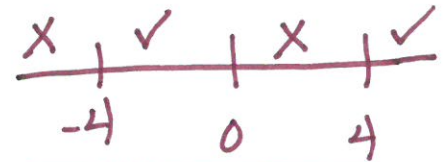$(-\infty, 0] \cup [.5628, \infty)$

11. $x^4 + 5x^2 \geq 36$

$x^4 + 5x^2 - 36 \geq 0$

$x \leq -2$ or $x \geq 2$

-or-

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

12. $\frac{2x}{16 - x^2} < 0$
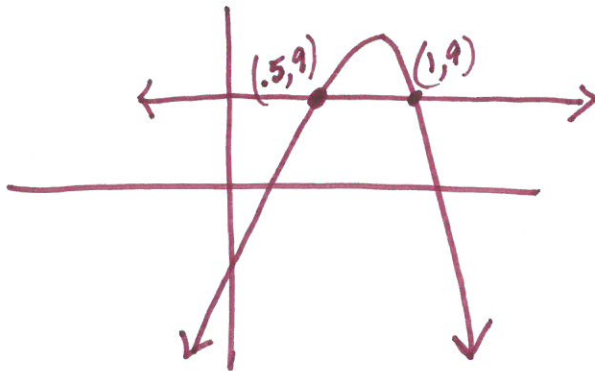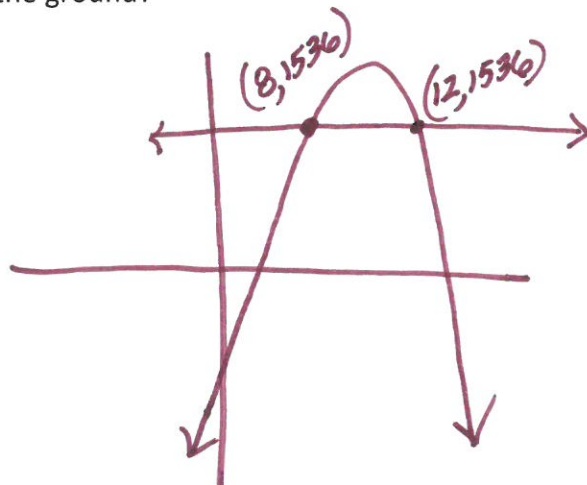
$\frac{2x}{(4-x)(4+x)} < 0$

$-4 < x < 0$ or $x > 4$

-or-

$(-4, 0) \cup (4, \infty)$

13. Guiness Book of World Records reports that German Shepherds can make vertical leaps of over 10 feet when scaling walls. If the distance s (in feet) off the ground after t seconds is given by the equation $s = -16t^2 + 24t + 1$, for how many seconds is the dog more than 9 feet off the ground?

$1 - \frac{1}{2} = \frac{1}{2}$ sec.

14. If an object is projected vertically upward from ground level with an initial velocity of 320 ft/sec, then its distance s above the ground after t seconds is given by $s = -16t^2 + 320t$. For what values of t will the object be more than 1536 feet above the ground?

$8 \leq t \leq 12$