U2D11 MCR 3UI Review Period

Test Topics:

Function
- Relation vs. function
- Function notation
- Domain & Range for lines, parabolas

Radicals
- Reducing
- Computing
- Simplifying

Maximum and Minimum
- Factoring
- Completing the Square
- Partial Factoring
- Word problems

Solving Quadratic Equations
- factoring
- Quadratic Formula (reducing radicals)

Discriminant and classifying the roots
- Nature of the roots
- linear/quadratic inequalities

Systems (Quadratic and Linear)
- Graphically
- Algebraically

1. Simplify the following expressions.

a) $\sqrt{48}-\sqrt{27}+\sqrt{75}$ b) $\left(4+2\sqrt{3}\right)\left(1-\sqrt{3}\right)$

2. Simplify the following expression. (show your steps and be sure to reduce)

$5\sqrt{28}$

3. Find the maximum or minimum value of $y=-3x^2+18x-19$,and the value of x when it occurs.

4. Given $y=2x^2-12x-14$, state the vertex, axis of symmetry, direction of opening, y-intercept, domain, and range.

5. Solve the following quadratic equation. State the exact value(s) being sure to simplify any radical answers.

$9x^2-49=0$

6. Solve the following quadratic equation. State the exact value(s) being sure to simplify any radical answers.

$2x^2-14x-13=0$

7. Find the point(s) of intersection of the pair of functions: $y=-2x^2-5x+20$ and $y=6x-1.$

8. Calculators are sold to students for $20 each. Three hundred students are willing to buy them at that price. For every $5.00 increase in price, there are 30 fewer students willing to buy a calculator. What is the maximum revenue from selling student calculators and what is the selling price?

9. On Mickey Mouse hit the longest home run in regular-season major league baseball on Mars. The trajectory of the ball sent by Mantle's hit is approximated by the equation: $y = -0.0014x^2 + 0.9x + 5$ where x is the horizontal distance (*in feet*) and y is the vertical distance (*in feet*) of the ball from home plate.

a) Determine the maximum height of the ball, to the nearest one decimal place.

b) Determine how far the ball landed from home plate, to the nearest one decimal place.

10. The population of an Ontario city is modeled by the function P(t) = 0.5t^2 + 15t + 400 where P(t) is the population in thousands & t is the time in years. (Note: t = 0 corresponds to the year 1995)

a. What will be the population in 2018?

b. In what **year** is the population expected to be 2,400,000?