Name: _____

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Sure Bets #5 – Quadratics 2

1. For each of the following, determine:
   a) Direction of opening   b) The zeros
   c) The y-intercept   d) The axis of symmetry
   e) The vertex

   i) $y = (x-3)(x+7)$ ii) $y = -3x^2 - 9x + 84$,

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2. Use FOIL to simplify the expression $3(x-2)(3x-1)$.

2

3. Factor
   a) $9x^2 + 3$ b) $x^2 - x - 42$ c) $5a^2 - 20$

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   d) $12x^2 - 5x - 3$ e) $x^2 - 1$ f) $3x^2 - 33x + 84$

4. Determine the equation of the parabola, in factored form, that has x-intercepts of 7 and -5 and a y-intercept of 70.

3

5. Determine how many roots each parabola has.
   a) $y = 4x^2 + 3x - 4$ b) $y = -2(x-34)(x+14)$

3

6. Solve the following equations.

a) $4x^2 - 36 = 0$

b) $2x(x-4) = 3x(x-5)$

6

7. Studies have shown that the admission at a high school basketball tournament can be modelled by $P = -100x^2 + 1400x - 2400$ where x is the number of tickets sold in hundreds, and P is the profit.
   a) What are the break-even points for the tournament organizers?
   b) How many tickets must be sold to maximize profits?
   c) What is the maximum profit the tournament can earn?

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8. The Math Department is selling "Math Rules" t-shirts at a cost of $12 each. Last year, they sold a total of 80 t-shirts. Based on past experience, Mr. Casella has calculated that when they decrease the price by $0.50 the sales increase by 2 t-shirts. In order to break even $1200 in revenue is needed. Is this possible?

4

9. A golf ball is hit off a tee. Its height above the ground can be approximated by using the equation $h = 24t - 4t^2$, where h is the height above the ground in meters and t is the time in seconds.
   a) When does the ball hit the ground?
   b) What is the maximum height of the golf ball? After how many seconds does this occur?
   c) When does the golf ball reach a height of 20 m?

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NOT A QUADRATIC QUESTION!
10. Each spring, the conservation authority stocks the local lake with 10,000 bass and perch. If there were four times as many bass and twice as many perch, the total number of fish would be 35,000. How many of each type of fish make up the 10,000?

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