MPM 2D1 Name: _____

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Sure Bets #4 – Quadratics 1

1. Use finite differences to determine whether the following represent linear or quadratic relations.

x	3	4	5	6	7
y	7	14	23	34	47

x	-4	-3	-2	-1	0
y	14	11	8	5	2

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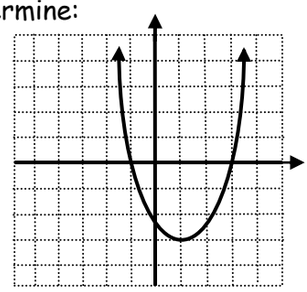
2. Given the quadratic below, label with the correct coordinates and/or determine:



a) vertex b) zeros

c) axis of symmetry d) optimal value

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e) direction of opening f) 2nd differences

g) maximum/minimum

3. 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) $y = (x+1)(x-5)$ ii) $y = 2x^2 - 6x - 80$

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4. Write the equation of the parabola, in factored form, that has zeros of -9 and 1, and a y-intercept of 18.

3

5. Using FOIL, expand and simplify each expression.

a) $(x+5)(x-2)$ b) $(2x+3)^2$ c) $-2(5x-1)(3x+4)$

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6. Common factor each expression.

a) $9x^2 - 6x + 18$ b) $-25m^2 - 10m$ c) $3a^5c^3 - 2ac^2 + 7ac$

3

7. Factor each simple trinomial.

a) $x^2 + 4x + 3$ b) $n^2 + n - 6$ c) $a^2 - 9a + 20$

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d) $x^2 + 6x - 16$ e) $3x^2 + 24x + 45$ f) $6n^2 + 24n - 30$

8. Factor each complex trinomial.

a) $2x^2 + x - 6$ b) $3b^2 - 11b - 4$

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9. A computer software company models the profit, P million of dollars, on its latest video game using $P = -2x^2 + 32x - 110$, where x is the number of games sold in thousands.

a) What are the break even points (where they make no money) for the company?

b) What is the maximum profit that the company can earn?

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10. Slacks Incorporated sold 6000 pairs of pants last month at an average of $44 each. The store is planning to increase prices in order to increase profits. Sales forecasts indicate that sales will drop by 200 for every dollar increase in price. What price will maximize profits?

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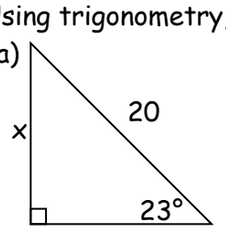
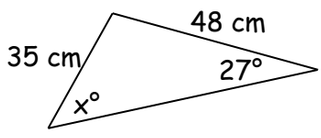
11. Using trigonometry, determine the unknown value in each diagram.

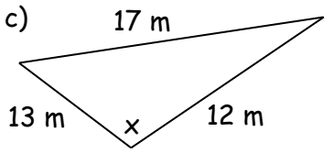
a)



b)



c)



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