

**Aim: How do we use quadratic equations to solve optimization problems?****I. Do Now:**

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| 1. Write an equation for a parabola with vertex (2, 16) and that passes through the point (0, 10). | 2. Write in vertex form and find the values of $1a$ , $3a$ , and $5a$ for the equation $R(x) = 900x - 0.1x^2$ |
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**II. Optimization – Real World Applications.** (Represent each situation using a quadratic function.)

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| 3. The sum of two numbers is 12. What is their largest possible product? | 4. The sum of two numbers is 100. Find the numbers that will maximize their product. |
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| 5. Find the number of units, $x$ , that produces a maximum revenue as given by the function<br>$R(x) = 900x - 0.1x^2$ | 6. Wilie jumps off of a diving board that is 10 feet above the surface of a swimming pool. Jumping upward and outward, he reaches a maximum height of 16 feet above the surface of the water when he has jumped outward 2 feet.<br>(a) Draw a diagram.<br>(b) Find an equation for his parabolic path.<br>(c) When he hits the water, how far out has he reached, to the nearest tenth of a foot. | 7. A ball is thrown. The height of the ball at time $t$ , in seconds, is given by the equation<br>$h(t) = -16t^2 + 96t + 4$<br>(a) Find the height at 0 seconds.<br>(b) Find the height at 2 seconds.<br>(c) Find the maximum height of the ball.<br>(d) When does the ball reach its maximum height?<br>(e) When does the ball hit the ground? |
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**HW25**

- Read page 95.
- p. 96: 24, 31, 59, 66
- Complete this sheet.