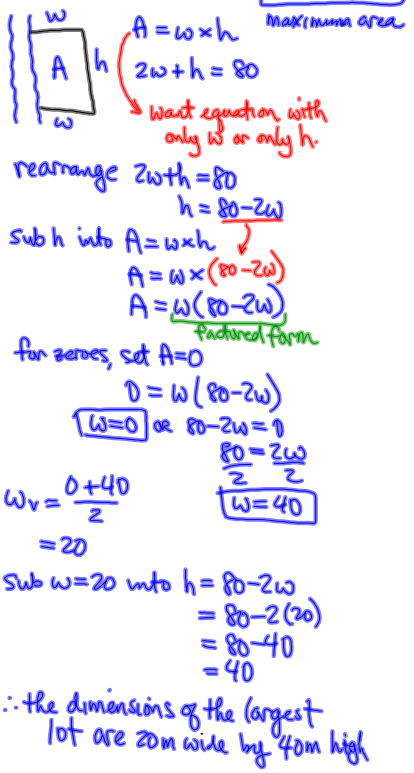
Applications of Quadratics in Factored Form

1. A rectangular lot is bounded on one side by a river and on the other three sides by 80m of fencing. Determine the dimensions of the largest lot possible.



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2. Supermarket cashiers try to memorize current sale prices while they work. A study showed that, on average, the percent, P, of prices memorized after t hours is given approximately by the formula

$$P = -40t^2 + 120t$$

What is the greatest percent of prices memorized, and how long does it take to memorize them?

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3. The cost of a ticket to a hockey arena which seats 800 people is $3. At this price, every ticket is sold. A survey indicates that for every dollar increase in price, attendance will fall by 100 people. What ticket price results in the greatest revenue? What is the greatest revenue?

Revenue = (# of tickets) × (cost per ticket)

2400 = 800 × 3

2800 = 700 × 4

$R = (800 - 100x)(3 + x)$

Let x represent the # of $1 increases

for zeroes, set $R = 0$

$0 = (800 - 100x)(3 + x)$

$800 - 100x = 0$ or $3 + x = 0$

$800 = 100x$ $\quad x = -3$

$x = 8$

$x_v = \frac{8 + (-3)}{2}$

$= \frac{5}{2}$

$= 2.5$

∴ max revenue at a ticket price of $3 + 2.5 = 5.5$

for greatest R, sub $x = 2.5$

$R = (800 - 100(2.5))(3 + 2.5)$

$= (800 - 250)(5.5)$

$= (550)(5.5)$

$R = 3025$

∴ max revenue is $3025

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4. Determine the number which exceeds its square by the greatest possible amount.

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Assigned Work: #2 from handout

p. 282 # 6, 14, 16, 19
p. 300 # 14c, 15