Quadratic applications and model checks

Name: _____ Date: _____

6 questions | 19 marks

1. A rectangle is 3 cm longer than it is wide and has area 54 cm². Find its dimensions. [3 marks]

2. A photo is 6 cm by 10 cm. A uniform border makes the total area 96 cm². Find the border width. [4 marks]

3. A ball's height is $h = -5t^2 + 20t + 1$ metres after t seconds. Find its maximum height and when it occurs. [3 marks]

4. A model gives ticket revenue $R = p(80 - 2p)$ dollars when price p dollars satisfies $0 \le p \le 40$. Find the price giving greatest predicted revenue. [3 marks]

5. A design width x metres must satisfy $x^2 - 5x + 6 = 0$ and $x > 2$. Which root is allowed? [2 marks]

6. A proposed height model is $h = -t^2 + 6t + 2$. At t=4, a measurement is 9.5 m. Find the model's error there and explain whether one check proves the model valid at all times. [4 marks]