

Name: ANSWER KEY

Score: \_\_\_\_\_

The growth rate of an infant is related to the present weight  $x$  (in lb) by the formula  $y = cx(21-x)$  ( $c > 0$ ,  $0 < x < 21$ ). At what weight does maximum growth occur?

$$= -cx^2 + 21cx$$

The quadratic function opens downward (coefficient of  $x^2$  is  $-cx < 0$ ),  
hence has a maximum at  $x = -\frac{b}{2a} = -\frac{21c}{2(-c)} = \boxed{\frac{21}{2} = 10\frac{1}{2}}$