6-7: Exponential Growth and Decay Models

① $C = 1000$

$r = 6.5\% = .065$

$1 + r = 1 + .065 = 1.065$

$t = 5$

$y = C(1+r)^t$

$y = 1000(1.065)^5$

$y = \$1370.09$

100

double = 100%
triple = 200%
quadruple = 300%

② $C = 100$

$r = 1$

$1 + r = 1 + 1 = 2$

$t = 8$

$$y = 100(2)^8$$

$$= \boxed{25,600 \text{ bacteria}}$$

③ $C = 20$

$r = 2$

$1 + r = 1 + 2 = 3$

$t = 5$

$y = 20(3)^5$

$y = \boxed{4860 \text{ rabbits}}$

Decay

$y = C(1-r)^t$

① $C = 103$

$y = 103(.832)^{14}$

$r = .168$

$1 - r = 1 - .168 = .832$

$y = 8$ students

$t = 14$ yrs

② $C = 1800$

$r = .29$

$1 - r = 1 - .29 = .71$

$t = 2$

$y = 1800(.71)^2 = \$907.38$

1. $y = 30(1.2)^t$ - growth

$= 30(1 + .2)^t$

$1 + r = 1.2$

20 (20%)

2. $y = 30(.6)^t$ - decay

$1 - r = .6$

$r = .4$

(40%)

$1 - r = .6$

$-1 \quad -1$

$-r = -.4$

$-1 \quad -1$

$r = .4$

40%