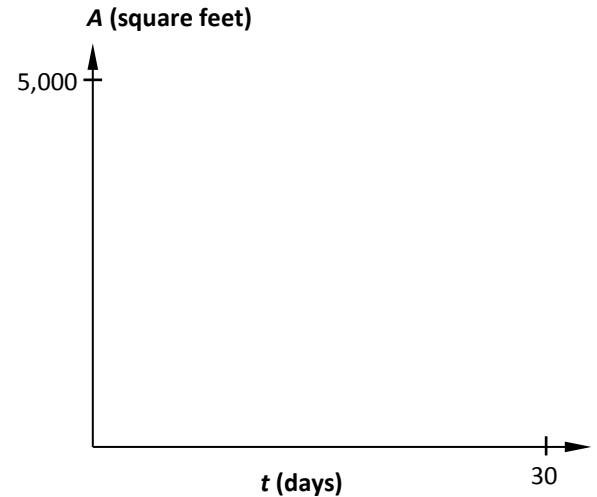


Algebra 1 CC
Assignment #59
Exponential Models Based on Percent Growth
*** Optional**

1. An oil spill is spreading such that its area is given by the exponential function $A(t) = 250(1.15)^t$, where A is the area in square feet and t is the time that has elapsed in days.

- (a) How large was the oil spill initially, i.e. at $t = 0$?
- (b) By what percent is the oil spill increasing each hour?
- (c) Sketch a graph of the area of the oil spill over the interval $0 \leq t \leq 30$ and $0 \leq A \leq 5000$ using your calculator. Label the y-intercept.
- * (d) After how many days will the oil spill reach a size of 3,000 square feet? Round to the nearest tenth. Solve graphically using the **INTERSECT COMMAND** on your calculator.
- (e) What is the average rate of change of $A(t)$ over the interval $0 \leq t \leq 10$? Include proper units and don't round.



2. If a flock of ducks is growing by 6% per year and starts with a population of 68, how many ducks will be in the flock after 10 years?

- (1) 109 (2) 198 (3) 122 (4) 408

3. A bank account earns interest at a rate of 3.5% per year (in other words it increases in value by that percent) and starts with a balance of \$350. Which of the following equations would give the account's worth, W , as a function of the number of years, y , it has been gaining interest?

- (1) $W = 350(1.035)^y$ (2) $W = 350(0.35)^y$ (3) $W = 1.035y + 350$ (4) $W = 1.35y + 350$

R1. The expression $\frac{(x^{2a+1})^3}{(x^{a+3})^2}$ can be written as x^n , where n depends on the value of a .

- (a) If $a = 5$, then find the value of n . Show your work.
- (b) Find a binomial expression for n in general terms of a .

*R2. After placing an equation into his calculator Rob got the following table. He then determines that $x=6$ when $f(x)=-4$. Is he correct? Explain.

x	$f(x)$
-4	6
-2	3
0	-1
2	-4

*R3. Alberto invested \$5,000 at a 6% yearly interest rate. What will be the amount in his account after 8 years?

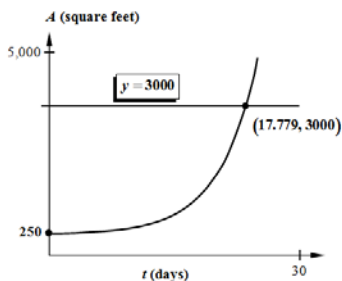
R4. Kris has incorrectly simplified the expression $\frac{20x^6}{4x^2}$ as $5x^3$.

(a) Show using the value $x = 2$ that $\frac{20x^6}{4x^2}$ and $5x^3$ are not equivalent.

(b) What is the correct simplification?

*R5. Simplify the expression $8(x + 11)^0 - 2x^0 + 6x$ when $x = -1$.

1. (a) 250
 (b) 15%
 (c)



- (d) 17.8
 (e) $76.14 \text{ ft}^2/\text{day}$

2. (3)
 3. (1)

R1. (a) $n=17$

(b) $n = 4a - 3$

R2. No, when $f(x) = -4$, $x=2$.

R3. \$7969.24

R4. (a) $80 \neq 40$

(b) $5x^4$

R5. 0