

## Exponential Growth Problems

1. p.116-117 # 29

- a. linear (x-values change by the same increment,  
common difference between successive y-values)
- b. exponential (x-values change by the same increment,  
common ratio between successive y-values)
- c. other
- d. exponential (x-values change by the same increment,  
common ratio between successive y-values)
- e. linear (x-values change by the same increment,  
common difference between successive y-values)
- f. other (x-values change by a different increment)
- g. exponential (x-values change by the same increment,  
common ratio between successive y-values)
- h. linear (rearrange table, x-values change by the same increment,  
common difference between successive y-values)
- i. exponential (rearrange table, x-values change by the same  
increment, common ratio between successive y-values)

2 a.  $40 \mu\text{g}/\text{cm}^3$

b.  $9.5 \mu\text{g}/\text{cm}^3$

c. After 8 h

3 a. y-intercept = 4, growth curve

b. y-intercept = 2, decay curve

c. y-intercept = 0.3, growth curve

d. y-intercept = 0.7, decay curve

4 a.

Number of years after motorcycle was purchased	0	1	2	3	4
Value of motorcycle (\$)	3000	2550	2167.50	1842.38	1566.02

b.  $V = 3000(0.85)^t$

c.  $V = 5500(0.78)^t$

5 a. 10%

b.  $D = 2.6$  mg Yes, there will be evidence of the drug.

6 a.  $A = 5000(1.08)^t$

b. \$ 19 980.10

7 a.  $V = 24000(0.82)^t$

b. \$ 7296.16

8 a.  $P = 85688(1.04)^t$

b.  $P = 112\,760$

9. p.136 # 30

a.  $y = 12(3)^{x/2}$

b.  $y = 48(1/2)^{x/3}$

c.  $y = 3(2)^{x/4}$

d.  $y = 60(2)^{10x}$

e.  $y = 6(1/3)^{5x}$

10 a. \$5475

b. i)  $M = 5475(1.06)^t$

ii)  $M = 5475(1.005)^{12t}$

c. i)  $M = \$9804.89$

ii)  $M = \$9961.20$

11. p.135 - 138

26.  $y = 5(1.2)^x$        $y = 5(3)^{x/6}$        $y = 5(9)^{x/12}$

27. \$78.11

29. Both are correct

31 a. 300 bacteria/cm<sup>2</sup>

b. 20 minutes

c. 1697 bacteria/cm<sup>2</sup>

33 a.  $I = 0.87(0.82)^d$

b.  $I = 0.87(0.76)^{d/2}$

c.  $I = 0.41$  candela/cm<sup>2</sup>

d.  $d = 7.8$  m

34 a.  $A = 2.8(1/2)^{t/5750}$

b. 0.66 mg

35. His assumption is incorrect. In 4 years,  $A = \$1414.21$ .

36 a.  $P = 3500(0.629)^{x/2}$

b.  $P = 1384$  frogs (equation not needed)

c.  $P = 691$  frogs

38 a.  $A = 5.2$  g

b. 92 h

39. \$283 000 (\$282 830)