

8.8 Exponential Growth homework

Name: _____ Date: _____ Hour: _____

For each function, do the following:

- a) Identify the initial amount, a , in each function
- b) State whether each function would show growth or decay
- c) Identify the growth factor or decay factor, b , in each function

1. $g(x) = 20 \cdot 2^x$ 2. $y = 200 \cdot (.05)^x$ 3. $y = 10,000 \cdot 1.01^x$ 4. $f(t) = \left(\frac{7}{8}\right)^t$

- | | | | |
|----|----|----|----|
| a) | a) | a) | a) |
| b) | b) | b) | b) |
| c) | c) | c) | c) |

5. Suppose the population of a city is 50,000 people and is growing 3% each year.

- a) The initial amount, a , is _____
- b) The growth factor, b , is 100% + 3% which is $1 + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$
- c) Complete the equation $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ — to find the population after x years.
- d) Use your equation to predict the population after 25 years.

Each question below gives interest rate as an annual interest rate. Then each question gives a starting balance. Complete the formula $y = a \cdot b^x$ as if the interest rate was compounded:

- a) Quarterly b) Monthly (note: you will leave time a variable, x .) 6a has been completed as an example.

6. 3%; \$500.

- a) For quarterly interest, divide the interest rate by 4, then add 100%.

Don't forget to multiply the time by 4 too! $y = 500 \cdot 1.0075^{4x}$

- b) For monthly interest, _____ the interest rate by _____, then add _____%.

Don't forget to _____ the _____ by _____ too! $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —

7. 4%; \$1,700

- a) For quarterly interest, _____ the interest rate by _____, then add _____%.

Don't forget to _____ the _____ by _____ too! $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —

- b) For monthly interest, _____ the interest rate by _____, then add _____%.

Don't forget to _____ the _____ by _____ too! $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —

8. 4.5%; \$25,000

- a) $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —
- b) $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —

9. 7.6%; \$32

- a) $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —
- b) $y = \underline{\hspace{1cm}} \cdot \underline{\hspace{1cm}}$ —

8.8 Exponential Growth homework

Name: _____ Date: _____ Hour: _____

Find the balance in each account a) annually, b) semi-annually, c) quarterly and d) monthly.

10. \$4,000 principal earning 6% annual interest after 5 years.

a) $y = \underline{\hspace{2cm}} \cdot (1 + \underline{\hspace{2cm}})^{\underline{\hspace{2cm}}} =$

b) $y = \underline{\hspace{2cm}} \cdot \left(1 + \frac{\hspace{1cm}}{2}\right)^{2\underline{\hspace{2cm}}} =$

c) $y = \underline{\hspace{2cm}} \cdot \left(1 + \frac{\hspace{1cm}}{4}\right)^{4\underline{\hspace{2cm}}} =$

d) $y = \underline{\hspace{2cm}} \cdot \left(1 + \frac{\hspace{1cm}}{12}\right)^{12\underline{\hspace{2cm}}} =$

11. \$12,000 principal earning 4.8% annual interest after 7 years.

a)

b)

c)

d)

12. \$500 principal earning 4% annual interest after 6 years.

a)

b)

c)

d)

13. \$20,000 principal earning 3.5% annual interest after 10 years.

a)

b)

c)

d)