

Exponential Functions

Date _____ Period _____

Identify the initial value (*a*) and the growth or decay factor (*b*). State whether it is growth or decay.

1) $y = 75 \cdot 1.46^t$

a:

b:

Growth or Decay?

2) $y = \frac{1}{4} \cdot 1.07^t$

a:

b:

Growth or Decay?

3) $y = 2 \cdot 0.87^t$

a:

b:

Growth or Decay?

4) $y = 135 \cdot 0.99^t$

a:

b:

Growth or Decay?

5) $y = 10 \cdot 1.12^t$

a:

b:

Growth or Decay?

6) $y = 21 \cdot 0.45^t$

a:

b:

Growth or Decay?

Identify the growth or decay RATE and state whether it is growth or decay.

7) $y = \frac{1}{4} \cdot 0.93^t$

Rate:

Grow or Decay?

8) $y = 15 \cdot 1.75^t$

Rate:

Grow or Decay?

9) $y = 13 \cdot 0.79^t$

Rate:

Grow or Decay?

10) $y = 64 \cdot 1.13^{7t}$

Rate:

Grow or Decay?

11) $y = 28 \cdot 1.06^{18t}$

Rate:

Grow or Decay?

12) $y = 594 \cdot 0.63^{7t}$

Rate:

Grow or Decay?

Neal opens a savings account that earn interest monthly. He can estimate the total dollars d in his account, t years after opening the account by using $d = 4000 \cdot 1.0008^{12t}$.

13) How much money did Neal initially put into the account?

14) What is the YEARLY RATE on the account? Is it growing or decaying?

15) How much money will Neal have in 20 years?

The deer population, p , in a forest preserve, t years after 2005 can be estimated using the function $p = 440 \cdot 0.92^t$.

16) What was the size of the deer population in 2005?

17) What was the size of the deer population in 2013?

18) What will be the size of the deer population in 2025?

19) What is the growth or decay RATE of the deer population? Is it a growth or decay?

A wolf population may be related to the deer population. The wolf population, w , can be estimated t , years after 2005 using the function $w = 117 \cdot 0.98^{2t}$.

20) What was the size of the wolf population in 2005?

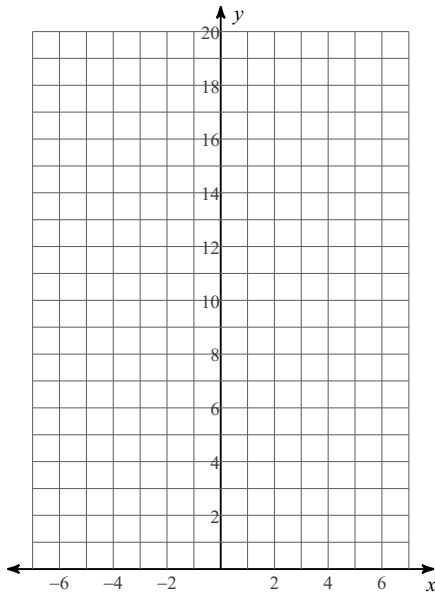
21) What was the size of the wolf population in 2013?

22) What will be the size of the wolf population in 2025?

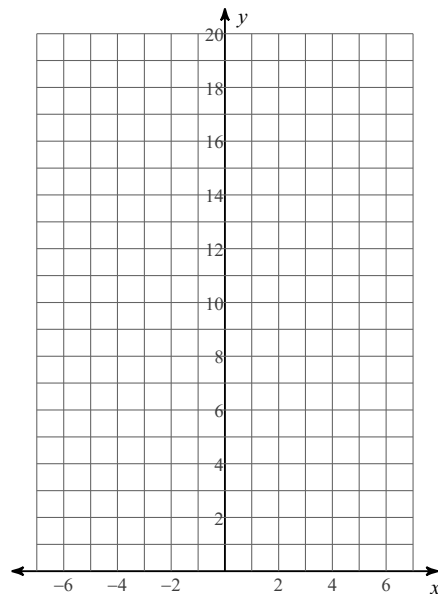
23) Which population is changing faster between the deer and the wolves? Explain your answer.

Graph each exponential function. State whether it is a growth or decay function.

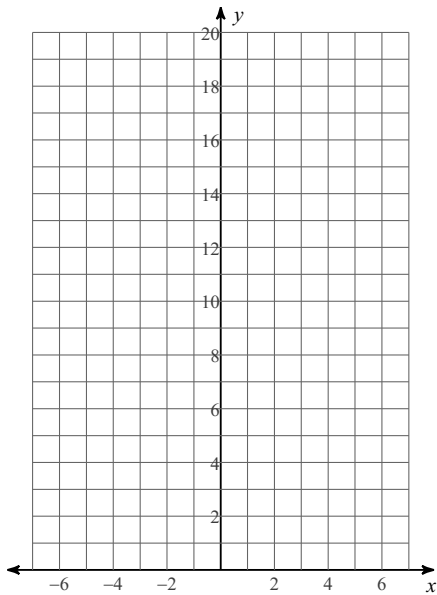
24) $y = \frac{1}{2} \cdot 2^x$



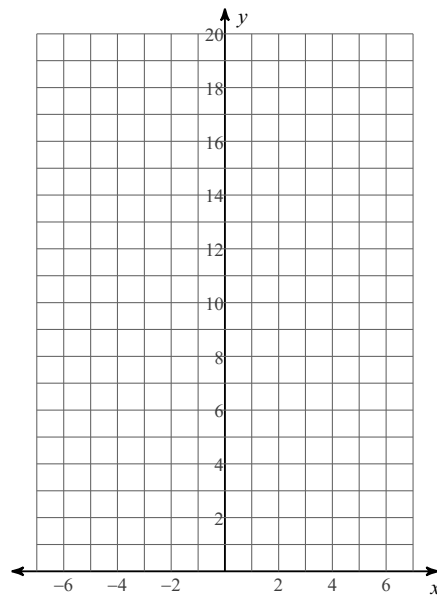
25) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



$$26) y = 2 \cdot \left(\frac{1}{3}\right)^x$$



$$27) y = 2 \cdot 3^x$$



Perform the indicated operation.

$$28) \begin{aligned} f(x) &= x^3 + x \\ g(x) &= -2x \\ \text{Find } (f \cdot g)(x) \end{aligned}$$

$$29) \begin{aligned} g(x) &= 2x - 5 \\ f(x) &= 3x - 1 \\ \text{Find } (g + f)(x) \end{aligned}$$

Factor each completely.

$$30) x^2 - 13x + 30$$

$$31) n^2 - 7n - 30$$

$$32) n^2 - 6n + 5$$

$$33) x^2 - 7x - 8$$

$$34) v^2 - 3v$$

$$35) r^2 + r - 72$$

Find the x-intercepts by factoring.

$$36) y = x^2 + 4x - 21$$

$$37) x^2 + 8x = 0$$