$r = .14$ P $n = 12$ $t = 1$

1. Joey purchases a jet ski for $6100 using a credit card. The interest is charged on an unpaid balance at a rate of 14% per year compounded monthly. If Joey makes no payment for one year, how much does he owe at the end of that year?

$$y = 6100\left(1 + \frac{.14}{12}\right)^{12 \cdot 1}$$

$$\boxed{y \approx \$7010.99}$$

2. The number of newly reported cases of tuberculosis, T, (in thousands) in the US from 1991 to 1996 can be approximated by the equation $T = 28.5(0.9567)^t$, where t represents the number of years since 1991.
   a) Identify the initial amount, the decay factor, and the annual percent decrease.
   b) Estimate the number of newly reported cases in 2017 if this trend continues. Round to the nearest hundredth.

$t = 26$

a) initial amount $= 28.5$ thousand
decay factor $= 0.9567$
annual % decrease $= 4.33\%$

$$0.9567 = 1 - r$$
$$-1 \qquad\qquad -1$$
$$-0.0433 = -r$$
$$-1 \qquad\quad -1$$
$$0.0433 = r$$

b) $T = 28.5(0.9567)^{26} \approx 9.02$ thousand

3. A diamond ring was purchased twenty years ago for $775. The value of the ring increased by 8% each year. What is the value of the ring today rounded to the nearest dollar?

p

r = .08

t = 20

$y = 775(1+.08)^{20}$

$y \approx \$3612$

4. From 1991 to 1995, the number of computers, C, per 100 people worldwide can be modeled by $C = 25.2(1.15)^t$, where t is the number of years since 1991.
   a) Identify the initial amount, the growth factor, and the annual percent increase.
   b) Estimate the number of computers in 1995.

t = 4

a) initial amount = 25.2 per 100 people

growth factor = 1.15

annual % increase = 15%

$1.15 = 1 + r$

$-1 \quad -1$

$.15 = r$

b) $C = 25.2(1.15)^4$

$C \approx 44$ computers per 100 people

base = $\frac{1}{2}$

5. Phosphorous-32 is used to study a plant's use of fertilizer. It has a half-life of 14 days. Write and use an exponential function for a 50 mg sample to find the amount remaining after 60 days. Round to the nearest hundredth.

initial amt

t = 60

$y = 50\left(\frac{1}{2}\right)^{\frac{60}{14}}$

$y \approx 2.56$ mg

In. amt r = .0475 t=4

6. Jessy deposits $3200 in an account that earns 4.75% annual interest. Find the balance after 5 years if the interest is compounded with the given frequencies.

a) quarterly $n=4$

$A = 3200\left(1+\frac{.0475}{4}\right)^{4 \cdot 5}$

$A \approx \$4052.17$

b) daily $n=365$

$A = 3200\left(1+\frac{.0475}{365}\right)^{365 \cdot 2}$

$A \approx \$4057.78$

c) semiannually $n=2$

$A = 3200\left(1+\frac{.0475}{2}\right)^{2 \cdot 5}$

$A \approx \$4046.59$

7. A new boat valued at $27,000 depreciates at the rate of 12.7% per year.
   a) Write a function that models the value of the boat.
   b) Find the value of the boat after two years.

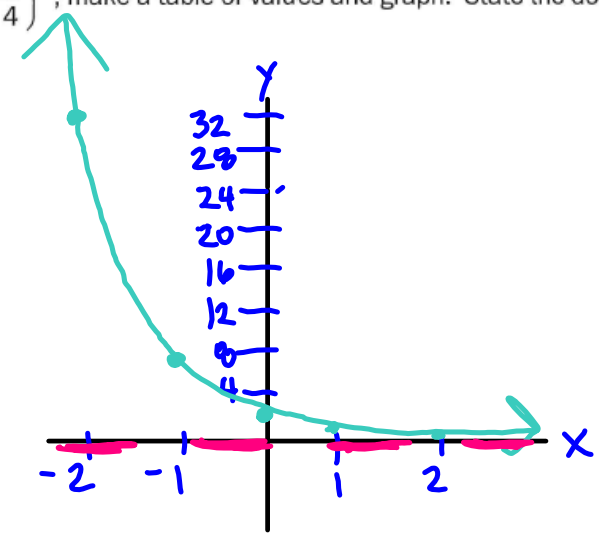
a) $y = 27{,}000(1 - .127)^t$

b) $y = 27{,}000(1 - .127)^2$

$y \approx \$20{,}557.48$

8. **NO CALCULATOR:** For the function $f(x) = 2 \cdot \left(\frac{1}{4}\right)^x$, make a table of values and graph. State the domain, range, and the equation of the asymptote.

x	y
-2	$2\left(\frac{1}{4}\right)^{-2} = 2\left(\frac{4}{1}\right)^2 = 32$
-1	$2\left(\frac{1}{4}\right)^{-1} = 2\left(\frac{4}{1}\right)^1 = 8$
0	$2\left(\frac{1}{4}\right)^0 = 2$
1	$2\left(\frac{1}{4}\right)^1 = \frac{1}{2}$
2	$2\left(\frac{1}{4}\right)^2 = \frac{1}{8}$



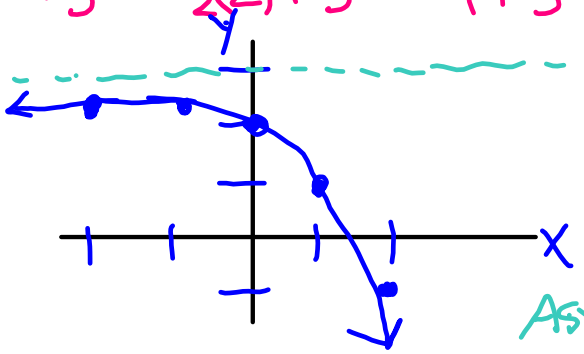
D: $\mathbb{R}$

R: $y > 0$

Asymptote: $y = 0$

9. **NO CALCULATOR:** For the function $y = -\frac{1}{2} \cdot 2^{x+1} + 3$, make a table of values and graph. State the domain, range, and the equation of the asymptote.

x	y
−2	$-\frac{1}{2}(2)^{-2+1}+3 = -\frac{1}{2}(2)^{-1}+3 = -\frac{1}{2}\left(\frac{1}{2}\right)^{1}+3 = -\frac{1}{4}+\frac{12}{4} = \frac{11}{4}$
−1	$-\frac{1}{2}(2)^{-1+1}+3 = -\frac{1}{2}(2)^{0}+3 = -\frac{1}{2}+3 = -\frac{1}{2}+\frac{6}{2} = \frac{5}{2}$
0	$-\frac{1}{2}(2)^{0+1}+3 = -\frac{1}{2}(2)^{1}+3 = -1+3 = 2$
1	$-\frac{1}{2}(2)^{1+1}+3 = -\frac{1}{2}(2)^{2}+3 = -2+3 = 1$
2	$-\frac{1}{2}(2)^{2+1}+3 = -\frac{1}{2}(2)^{3}+3 = -4+3 = -1$



D: $\mathbb{R}$

R: $y < 3$

Asym: $y = 3$