

January 7th

Due Today: 6.2 HW

Unit 6: Exponents and Radicals

Lesson 6.3: Exponential Growth and Decay

Get Ready: Check your HW answers:

1) $\frac{y^{16}}{x^2}$

2) $\frac{2y}{x^3}$

3) $\frac{x^3}{8y^2}$

4) $\frac{4}{y^7}$

5) $8a^4b^2$

6) $\frac{2v^{11}}{u}$

7) $\frac{y^8}{2z^2}$

8) $\frac{h^4}{4j^8k^5}$

$$\textcircled{7} \frac{(y^{-4} z^4)^{-1}}{2x^4 \cdot \cancel{x^{-4}} y^{-4} z^{-2}}$$

$$= \frac{y^4 z^{-4}}{2y^{-4} z^{-2}}$$

$$y: 4 + 4 = 8$$

$$z: 4 + 2 = -2$$

$$= \frac{1 y^8 z^{-2}}{2}$$

$$= \frac{y^8}{2z^2}$$

⑤

$$\frac{2a}{2a^4b^4(2a^3b^2)^{-3}}$$

$$\textcircled{2^3} a^{-9} b^{-6}$$

~~$$\frac{2a \cdot 2^3}{2a^4b^4 a^{-9} b^{-6}}$$~~

~~$$= \frac{8a}{a^{-5} b^{-2}}$$~~

$$8a \cdot a^5 \cdot b^2$$

$$\boxed{8a^6b^2}$$

$$\textcircled{4} \quad \frac{4x^1y^1 \cdot 3x^{-4}y^{-4}}{3x^{-3}y^3}$$

$$\frac{4 \cancel{x^1} \cancel{y^1} \cdot 3 \cancel{x^{-4}} \cancel{y^{-4}}}{3 \cancel{x^{-3}} \cancel{y^3}}$$

$$\frac{4y^{-4}}{y^3} \quad -4 - 3 = -7$$

$$4y^{-7} = \frac{4}{y^7}$$

$$\textcircled{2} \quad \frac{\cancel{4x^2}y^{\cancel{-4}} \cdot 2y^{\cancel{-2}}}{\cancel{4x^3}y^{\cancel{-4}}}$$

$$-3 - 4 = -1$$

$$\frac{2y}{x^3}$$

$$\frac{8y^{-3}}{4x^3y^{-4}}$$

$$\frac{2y}{x^3}$$

Exponential Growth and Decay Vocabulary

Principal

Interest

Appreciates

Depreciates

Omar has \$200 invested at a bank that pays 4% yearly interest.

How much will he have in 3 years?

$$200(0.04) = \$8 \leftarrow \text{1st year's interest}$$

$$\textcircled{1} \quad 200 + 8 = \$208 \leftarrow \text{1st year total}$$

$$208(0.04) = \$8.32 \leftarrow \text{2nd year interest}$$

$$\textcircled{2} \quad 208 + 8.32 = \$216.32 \leftarrow \text{2nd year total}$$

$$216.32(0.04) = 8.65 \leftarrow \text{3rd year interest}$$

$$\textcircled{3} \quad 216.32 + 8.65 = \$224.97 \leftarrow \text{total after 3 years.}$$

How much will he have in 100 years?

Exponential Growth/Decay Formula

$$F(t) = A(1 \pm r)^t$$

A = original Amount, R = rate, t = time

A: 200

R: 0.04

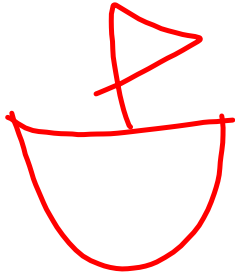
T: 100

$$F(t) = 200(1 + 0.04)^{100}$$

$$F(t) = 200(1.04)^{100}$$

calc: $200(1.04) \wedge 100$

$$= \$10,100.99$$



cost: 12,000

depreciates: 8% a month

\$1 worth in 3 months?

$$A = 12,000$$

$$R = 0.08$$

$$t = 3$$

$$F(t) = 12,000(1 - 0.08)^3$$

$$= 12,000(0.92)^3$$

$$= \$9374.26$$

3 years?

$$A = 12,000$$

$$R = 0.08$$

$$t = 36$$

Heather just graduated from College. She has \$50,000 in student loans. Her student loans earn 3.7% a month if she does not pay them.

If she doesn't make any payments, how much money will Heather owe in 6 months?

How much money will she owe in 5 years?

Growth/Decay Factors

$$Y = 200 (1.32)^5$$

↓
growth factor
always bigger
than 1

Rate: 32%

$$Y = 200 (0.68)^5$$

↓
Decay Factor
always less than 1
1 - .68

Rate: 32%

	G/D	Original	Percent	Time
$Y = 50 (1.16)^2$	G	50	16%	2
$Y = 125 (0.9)^3$	D	125	10%	3
$Y = 31(0.71)^{24}$	D	31	29%	24

The population of the Australian Sea Turtle decreases at a rate of 12% a year. If there were 8,350 sea turtles in January of 2009, how many turtles are there now?



Miranda invested \$4,000 in a bank with 1.2% interest per year. How much money will she have in 5 years? $\rightarrow 0.012$

Kimmy bought a \$500 iPad on her credit card. The card earns 2% interest a month. If Kimmy doesn't pay off the card, how much will she owe in 3 months? In 1 year?



Mr. Thomason bought a plot of land for \$250,000. The land increases in value at a rate of 5.1% a year. How much will the land be worth at in a decade?

$$F(t) = 8350(.88)^7 = 3412$$

$$F(t) = 4000(1.012)^5 = 4,245.83$$

$$F(t) = 500(1.02)^3$$

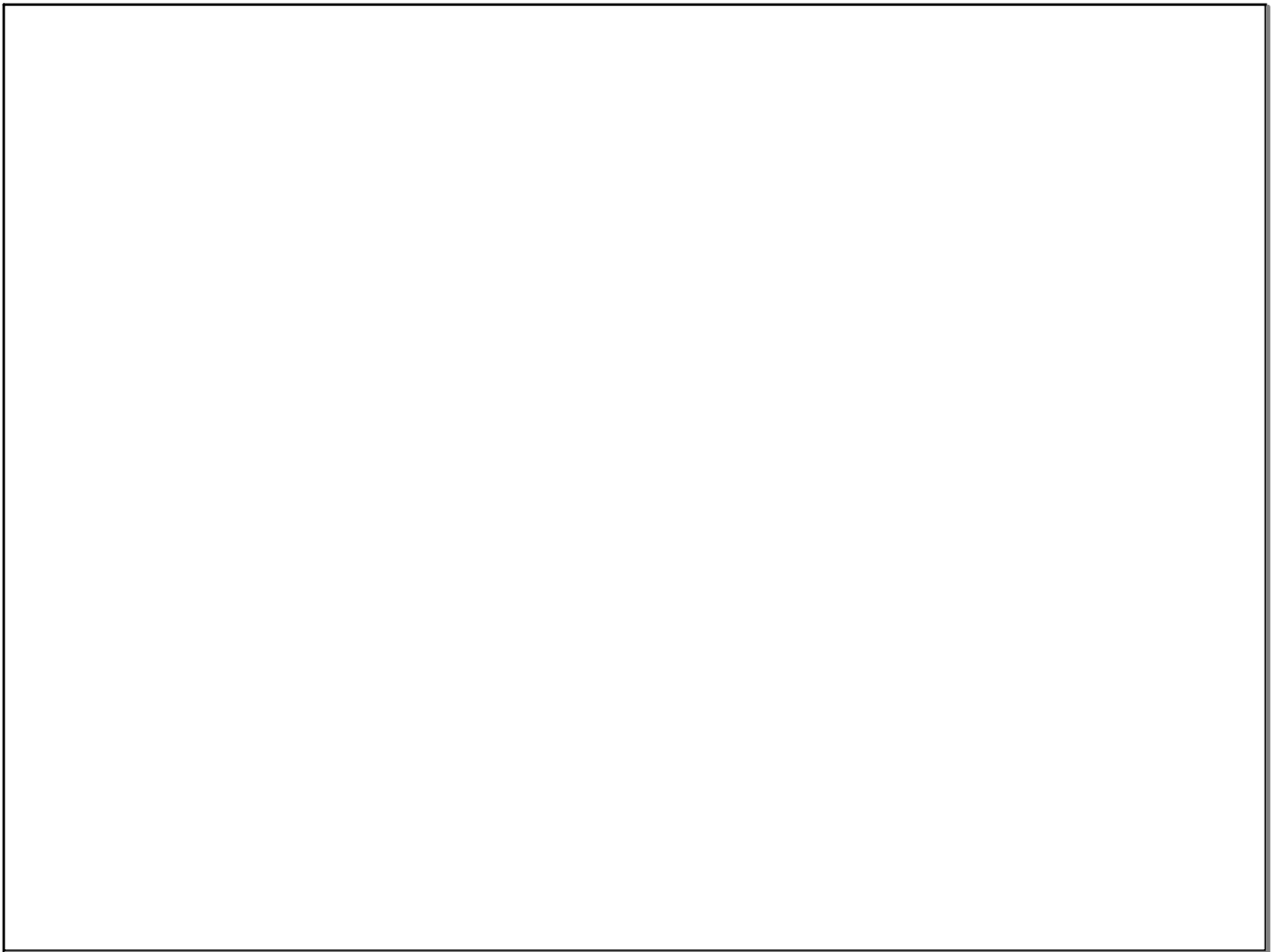
\$ 530.61

$$F(t) = 500(1.02)^{12}$$

\$ 634.13

$$F(t) = 250,000(1.051)^{10}$$

\$ 411,118.64



Unit 6: Exponents and Radicals

Lesson #	Name	Recap	HW
6.1	Review of basic Exponent Laws		HW 6.1 *unit 5 corrections
6.2	Challenge Practice		HW 6.2
6.3	Exponential Growth and Decay		HW 6.3
6.4	Simplifying Radicals		6.4 VN 6.4 Delta Math