C12 - 7.3 - Word Problems Notes

If you deposit $2000 in the bank at 12% interest how much will you have after 8 years?

$$F = P(1 \pm r)^t$$
$$F = 2000(1 + 0.12)^8$$
$$F = 4951.93$$

If you deposit $5000 in the bank at 8% interest, compounded quarterly, how much will you have after 6 years?

$$F = P\left(1 \pm \frac{r}{n}\right)^{tn}$$
$$F = 5000\left(1 + \frac{0.08}{4}\right)^{6\times4}$$
$$F = 8042.19$$

Find the rate to triple your money in 10 years.

$$F = P(1 + r)^t$$
$$3 = 1(1 + r)^{10}$$
$$(3)^{\frac{1}{10}} = \left((1 + r)^{10}\right)^{\frac{1}{10}}$$
$$1.116 = 1 + r$$
$$r = 0.1116 = 11.6\%$$

If a population starts at 1000 and triples every 4 hours, how large will the population grow in 25 hours?

$$F = P(r)^{\frac{t}{T}}$$
$$F = 1000(3)^{\frac{25}{4}}$$
$$F = 959417\ pop$$

If the population starts at 300 and grows continuously at a rate of 0.06, how large will it grow after 20 days?

$$F = Pe^{kt}$$
$$F = 300e^{0.06\times20}$$
$$F = 996.03\ pop$$

How many times as intense is an earthquake of 6.0 than 3.0?

$$I = 10^{b-s}$$
$$I = 10^{6-3}$$
$$I = 10^3$$
$$I = 1000\ times$$

Find the present value of deposit worth $2000 in the bank at 10% interest how much will you have after 4 years?

$$F = P(1 \pm r)^t$$
$$2000 = P(1 + 0.1)^4$$
$$2000 = P(1.4641)$$
$$P = \frac{2000}{1.1641}$$
$$P = \$1366.03$$

Find the rate of a $1000 deposit worth $1100 after 2 years.

$$F = P(1 \pm r)^t$$
$$1100 = 1000(1 + r)^2$$
$$\frac{1100}{1000} = (1 + r)^2$$
$$1.1 = (1 + r)^2$$
$$(1.1)^{\frac{1}{2}} = \left((1 + r)^2\right)^{\frac{1}{2}}$$
$$1.0488 = 1 + r$$
$$r = 0.0488$$
$$r = 4.9\%$$

How long to quadruple your money at 8%

$$F = P(1 \pm r)^t$$
$$400 = 100(1 + 0.08)^t$$
$$\frac{400}{100} = 1.08^t$$
$$4 = 1.08^t$$

$y_1 = y_2$

$Calc\ Intersection\ or\ "logs"$

$$t = 18.01\ yrs$$

If you deposit $100 in the bank, how long will it take to grow to $6400 if it doubles each year?

$$F = P(r)^{\frac{t}{T}}$$
$$6400 = 100(2)^{\frac{t}{1}}$$
$$\frac{6400}{100} = 2^t$$
$$64 = 2^t$$
$$2^6 = 2^t$$
$$t = 6s$$

An earth quake in California of Richter 8.5 Magnitude was 100 times as strong as an earth quake in Vancouver of what Richter Magnitude.

$$I = 10^{b-s}$$
$$100 = 10^{8.5-s}$$
$$10^2 = 10^{8.5-s}$$
$$2 = 8.5 - s$$
$$s = 6.5\ R$$

Light diminishes by 10% every 5 meters. Find the depth of 1% light.

$$F = P(1 \pm r)^{\frac{t}{T}}$$
$$1 = 100(1 - 0.1)^{\frac{d}{5}}$$
$$0.01 = 0.9^{\frac{d}{5}}$$
$$d = 218.5\ m$$