

MTH-PT Trigonometry Session 3 2/2

$$\$200,000 = A_0$$

$$\text{rate} = 9\%$$

$$\text{time} = \underline{15} \text{ yrs}$$

$$\text{compounded} = \text{monthly}$$

$$n = 12$$

$$A = A_0 \left(1 + \frac{r}{n}\right)^{nt}$$

$$\downarrow$$

$$\$200,000 \left(1 + \frac{0.09}{12}\right)^{(12)(15)}$$

$$= \boxed{\$767,608.65}$$

$$P = \$6,702$$

$$r = 3.5\%$$

$$t = 50 \text{ years}$$

compounded continuously

$$A = Pe^{rt}$$

$$\downarrow$$

$$\$6,702 e^{(0.035)(50)}$$

$$= \boxed{38,567.35}$$

Logarithmic form

$$\log_{\text{base } 3} 81 = \text{exponent } x$$

$$\log_a 20 = b$$

Exponential form

$$3^x = 81$$

$$\boxed{b = 20}$$

$$10^8 = 100,000,000$$

logarithmic  $\log_{10} 100,000,000 = 8$

$\log 100,000,000$

$$3^8 = X \rightarrow \boxed{\log_3 X = 8}$$

$$\log_e a = X \rightarrow e^X = a$$

$$\ln a = X$$

$$\ln X = \log_e X$$

"natural log"

$$\log_5 \frac{1}{125} = X$$

$$5^X = \frac{1}{125} = \frac{1}{5^3}$$

$$5^X = 5^{-3}$$

$$X = -3$$

$$\log_a 19 = \frac{1}{2}$$

$$(a^{\frac{1}{2}})^2 = (19)^2$$

$$(\sqrt{a})^2 = (19)^2$$

$$\boxed{a = 361}$$

$$\log_9 y = 81$$

$$9^{81} = y$$

$$1.) \log_2 \frac{1}{8} = x$$

$$2^x = \frac{1}{8}$$

$$2^x = 2^{-3}$$

$$\boxed{x = -3}$$

$$2.) \log_3 27 = x$$

$$3^x = 27$$

$$3^x = 3^3$$

$$\boxed{x = 3}$$

$$3.) \log_6 \frac{1}{216} = x$$

$$6^x = \frac{1}{216}$$

$$6^x = 6^{-3}$$

$$\boxed{x = -3}$$

$$\S \log_x x^b = b$$

$$x^b = x^b$$

$$\S \log_a a^{12} = \boxed{x}$$

$$a^x = a^{12}$$

$$\boxed{x = 12}$$

$$\log_8 27 = X$$

Change of Base

$$\log 8^X = \log 27$$

$$\log 8^{\boxed{X}} = \log 27$$

$$X = \frac{\log 27}{\log 8}$$

$$\frac{X \log 8}{\log 8} = \frac{\log 27}{\log 8}$$

$$\log_2 76 = X$$

$$\log 2^X = \log 76$$

$$\log 2^{\textcircled{X}} = \log 76$$

$$\frac{X \log 2}{\log 2} = \frac{\log 76}{\log 2}$$

$$X = \frac{\log 76}{\log 2} = \textcircled{6.25}$$

$$\log 8 = \log_{10} 8 = X$$

$$\log 10^X = \log 8$$

$$\log 10^{\textcircled{X}} = \log 8$$

$$X \frac{\log 10}{\log 10} = \frac{\log 8}{\log 10}$$

$$X = \frac{\log 8}{\log 10} = 0.9$$

$$\ln e^{\boxed{X}} = \ln 64$$

$$\ln e^{\textcircled{X}} = \ln 64$$

$$X (\ln e) = \ln 64$$

$$X (1) = \ln 64$$

$$X = \boxed{\ln 64}$$

$$\log_{10}$$

$$\log_e = \ln$$

$$\ln e = \log_e e$$

$$\log_e e = X$$

$$e^{\textcircled{X}} = e^{\textcircled{1}}$$

$$X = 1$$

$$\ln e^x = \ln$$

$$\ln e^x = \ln$$

$$x \ln e = \ln$$

$$x = \ln$$

Nate was hit by a car and sued them for \$10,000.

Nate wants to use his money to buy \$120,000 worth of Taylor Swift tickets.

If he is able to get an 8% interest rate, compounded continuously,

how many years will it take to get the tickets?

$$A = Pe^{rt}$$

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$$\frac{120,000}{10,000} = \frac{10,000 e^{0.08t}}{10,000} \quad (3 \text{ yrs})$$

$$\ln 12 = e^{0.08t}$$
$$\ln 12 = \ln e^{0.08t}$$
$$\ln 12 = 0.08t \ln e$$

$$\frac{\ln 12}{0.08} = \frac{0.08t}{0.08}$$

$$t = \frac{\ln 12}{0.08}$$

