CH. 7 REVIEW Name Key Hr. __

SHOW ALL WORK!!!

1. Solve and round to four decimal places.

$8^{x-4} = 3$

$\log_8 3 = x - 4$

$.5283 = x - 4$

$+4 \quad +4$

$4.5283 = x$

1. 4.5283

2. Solve and round to four decimal places.

$3e^{5x-3} - 8 = 7$

$+5 \quad +5$

$\frac{3e^{5x-3}}{3} = \frac{12}{3}$

$e^{5x-3} = 4$

$\ln 4 = 5x - 3$

$1.3863 = 5x - 3$

$+3 \quad +3$

$\frac{4.3863}{5} = \frac{5x}{5}$

2. .8773

3. Solve and round to four decimal places.

$\log(x-5) - 7 = -4$

$+7 \quad +7$

$\log_{10}(x-5) = 3$

$10^3 = x - 5$

$1{,}000 = x - 5$

$+5 \quad +5$

$x = 1{,}005$

3. 1,005

4. Write the equation $16^{\frac{1}{4}} = 2$ in logarithmic form.

4. $\log_{16} 2 = \frac{1}{4}$

5. Write the equation $\log_{10} 6 = 4x$ in exponential form.

5. $10^{4x} = 6$

6. Write the following in terms of common log. Then approximate the value to four decimal places.

$\log_4 19$

6. $\frac{\log 19}{\log 4}$

2.1240

7. The Gross Domestic Product (GDP) of the United States grew about 4.2% per year. In 1985, the GDP was $4717 billion.

7A. Assuming this rate of growth continues, what will the GDP of the U.S. be in the year 2014?

6A 15,652 billion

$Y = 4717(1.042)^{29}$

7B. In **what year** will the GDP reach $20,000 billion?

7B. 2021

$\frac{20,000}{4717} = \frac{4717(1.042)^x}{4717}$

$4.2310 = 1.042^x$

$\log_{1.042} 4.2310 = x$

$35.06 \rightarrow 36$

1985 + 36 = 2021

8. Mrs. Le's family bought a new house 10 years ago for $120,000. The house is now worth $205,000. Assuming a steady rate of growth, what was the yearly rate of appreciation?

8. 5.5%

$\frac{205,000}{120,000} = \frac{120,000(1+r)^{10}}{120,000}$

$\sqrt[10]{1.7083} = \sqrt[10]{(1+r)^{10}}$

$1.055 = 1 + r$

$r = .055$

5.5%

$Y = a(1+r)^x$ Not Pert!

9. The city of Raleigh, North Carolina, is growing continuously at a rate of 2.5%. The population in 1990 was 207,000.

T Pert

9A. Write an exponential growth equation where ***t*** is the number of years after 1990.

9A. $A = 207,000e^{.025(t)}$

9B. Use your equation to predict the population of Raleigh in 2015.

9B. $\approx 386,727$

$207,000e^{.025(25)} =$

6. In 2010 Caitlyn bought a house for $150,000.
In 2019 the house is now worth $230,000 Assuming a steady rate of growth, what was the yearly rate of appreciation?
Round to the nearest percent.

6. 4.86%

Not Perf

$$\frac{230,000}{150,000} = \frac{150,000(1+r)^9}{150,000}$$

$$\sqrt[9]{1.5333} = \sqrt[9]{(1+r)^9}$$

$$1.0486 = 1+r$$

$$-1 \quad -1$$

$r = .0486$

7. OxyContin has a half-life of 4 hours.
If a person on this substance consumed 30mg of OxyContin, how much would remain in the bloodstream 24 hours later?
Round to the nearest thousandth.

7. .4688 mg

$30\left(\frac{1}{2}\right)^6$

$30(.5)^6 = .46875$