

Classwork

1. Diego decided to invest his \$500 tax refund rather than spending it. He found a bank that would pay him 4% interest, compounded quarterly. If he deposits the entire \$500 and does not deposit or withdraw any other amount, how long will it take him to double his money in the account?
2. William wants to have a total of \$4000 in two years so that he can put a hot tub on his deck. He finds an account that pays 5% interest compounded monthly. How much should William put into this account so that he'll have \$4000 at the end of two years?
3. The annual consumption of pork per person was about 35 lb in 1997 and about 20 lb in 2007. Assuming consumption is decreasing according to the exponential-decay model:
 - a. Find the value of r , the rate of growth. Write the corresponding exponential equation.
 - b. Estimate the consumption of pork in 2010.
 - c. In what year (theoretically) will the consumption of pork be 10 lb per person?
4. Kelly plans to put her graduation money into an account and leave it there for 4 years while she goes to college. She receives \$750 in graduation money that she puts it into an account that earns 4.25% interest compounded semi-annually. How much will be in Kelly's account at the end of four years?
5. ABC Bank is offering to double your money! They say that if you invest with them at 6% interest compounded quarterly they will double your money. If you invest \$1500 in the account, how long will it take to double your money.
6. At what rate, converted semiannually, will \$600 amount to \$900 in 8 years?
7. The number of wolves in the wild in the northern section of the Cataraugus county is decreasing at the rate of 3.5% per year. Your environmental studies class has counted 80 wolves in the area. After how many years will this population of 80 wolves drop below 15 wolves if this rate of decrease continues?
8. Jane bought a Saturn Vue in 2002 for \$20,000. In 2007, the residual value of her Vue was \$15,000.
 - a. Find the value of r , the rate of growth. Write the corresponding exponential equation.
 - b. What is the residual value in 2010?
 - c. In what year (theoretically) will the residual value of the Vue be half of what Jane paid for it?

Exponential Equations Not Requiring Logarithms

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Solve each equation.

1) $4^{-2b+2} = 4^{-3b}$

2) $3^{-2r-3} = 81$

3) $5^{-2n} = 5^2$

4) $4^{-2x} = \frac{1}{16}$

5) $4^{3-3a} = 16$

6) $5^2 \cdot 5^{2v} = \frac{1}{5}$

7) $\frac{5^{3x+2}}{5^x} = 1$

8) $6^{3x+1} = 6^3$

9) $2^{3n} = 2^2$

10) $6^{2k-3} = 6^{2k-3}$

11) $\left(\frac{1}{6}\right)^{-3x} \cdot 36^{3x} = 36^{-2x-3}$

12) $\frac{4}{2^{1-p}} = 1$

13) $64^{m+3} \cdot 4^{-m-2} = 8$

14) $243^{2n-1} = 27^{3n+2}$

15) $\frac{\left(\frac{1}{3}\right)^{-2r-2}}{27} = \left(\frac{1}{81}\right)^{2r-2}$

16) $2^{-3x-1} \cdot 2^5 = 32$

17) $9 \cdot 3^{-2b-3} = 3^{-b}$

18) $3^{-2n} \cdot 3^{-2n} = 1$

19) $\frac{4^{3v+2}}{4^{2v-1}} = 4^{v+1}$

20) $125 \cdot 25^{-2x} = 1$

Answers to Exponential Equations Not Requiring Logarithms (ID: 1)

1) $\{-2\}$

2) $\left\{-\frac{7}{2}\right\}$

3) $\{-1\}$

4) $\{1\}$

5) $\left\{\frac{1}{3}\right\}$

6) $\left\{-\frac{3}{2}\right\}$

7) $\{-1\}$

8) $\left\{\frac{2}{3}\right\}$

9) $\left\{\frac{2}{3}\right\}$

10) $\{\text{All real numbers.}\}$

11) $\left\{-\frac{6}{13}\right\}$

12) $\{-1\}$

13) $\left\{-\frac{11}{4}\right\}$

14) $\{11\}$

15) $\left\{\frac{9}{10}\right\}$

16) $\left\{-\frac{1}{3}\right\}$

17) $\{-1\}$

18) $\{0\}$

19) No solution.

20) $\left\{\frac{3}{4}\right\}$