

Name: _____

Use the formula for compound interest to determine the amount of money in each account after interest is accrued.

19. An investor deposits \$1,000 in an account that promises an annual interest rate of 5%, compounded at the end of each year. How much will be in the account after seven years?
There will be \$1,407.10 in the account after seven years.

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

$$\begin{aligned} A(7) &= 1,000\left(1 + \frac{0.05}{1}\right)^{1 \cdot 7} \\ &= 1,000(1.05)^7 \\ &\approx 1,407.10 \end{aligned}$$

20. At the start of the school year, Fairview High School deposits PTA dues in an account that offers an annual interest rate of 3.5%, compounded at the end of each year. If \$2500 is collected in PTA dues, how much money will the school have at the start of the next school year?
21. Kyle put \$300 of his birthday money in the bank. The bank offers an annual interest rate of 4%, compounded twice a year. How much money will Kyle have after three years?
22. An investing group has \$50,000 to invest. They put the money in an account that has an annual interest rate of 6%, compounded monthly. How much money will the group have at the end of 10 years?
23. Interest is compounded quarterly at Money Bank at an annual rate of 5.5%. A new client opens an account with \$7200. How much money will be in the account at the end of six years?
24. Sasha wants to earn the maximum interest on her money. She decides to deposit \$50 in two different banks for 90 days (3 months) to compare them before she deposits all of her money. She finds a bank that compounds interest daily at an annual rate of 2.2% and another bank that compounds interest monthly at an annual rate of 4.8%. With which bank will she earn more money?

Use the formula for population growth to predict the population of each city.

25. The population of Austin, Texas is growing at a rate of 3.9% per year. If the population in 2010 was approximately 790,000, what is the predicted population for 2015?

The population of Austin, Texas will be about 960,096 in 2015.

$$N(t) = N_0 e^{rt}$$

$$N(5) = 790,000e^{(0.039 \cdot 5)}$$

$$= 790,000e^{0.195}$$

$$\approx 960,096$$

26. The population of Boston, Massachusetts is growing at a rate of 1.8% annually. The population in 2013 was approximately 636,500. What is the predicted population for 2025?

27. The population of Charlotte, North Carolina in 2013 was approximately 775,000. If the annual rate of growth is about 3.2%, what is an approximation of Charlotte's population in 2000?

28. The population of Beijing, China in 2012 was approximately 20,690,000 and is growing at an annual rate of about 5.5%. What is an approximation of Beijing's population in 1980?

29. The population of Detroit, Michigan is decreasing at an annual rate of about 0.75%. Detroit's population in 2013 was approximately 700,000. What is the predicted population for 2015?

30. The population of Berlin, Germany was about 3,290,000 in 2011. Its population is declining at an annual rate of about 0.2%. What is the predicted population for 2050?