

Algebra 1: 5.2 (Part 1) Homework

Name Answer Key Period

Write a function that represents each population as a function of time using $P(t) = P(1+r)^t$ or

$P(t) = P(1-r)^t$.

decay / decreasing

growth / increasing

1. Blueville has a population of 7000. Its population is increasing at a rate of 1.4%.

$P = 7000$

$r = 1.4\% \text{ or } 0.014$

$P(t) = 7000(1+0.014)^t = 7000(1.014)^t$

2. Youngstown has a population of 12,000. Its population is increasing at a rate of 1.2%.

$P = 12000$

$r = 1.2\% \text{ or } 0.012$

$P(t) = 12000(1+0.012)^t = 12000(1.012)^t$

3. Greenville has a population of 8000. Its population is decreasing at a rate of 1.75%.

$P = 8000$

$r = 1.75\% \text{ or } 0.0175$

$P(t) = 8000(1-0.0175)^t = 8000(0.9825)^t$

4. North Park has a population of 14,000. Its population is decreasing at a rate of 3.1%.

$P = 14000$

$r = 3.1\% = 0.031$

$P(t) = 14000(1-0.031)^t = 14000(0.969)^t$

Waynesburg has a population of 16,000. Its population is increasing at a rate of 1.5%. Write a function to represent the population as a function of time. Determine the population after a given number of years. Round your answer to the nearest whole number.

Function: $P(t) = P(1+r)^t$

$P = 16000$ $r = 1.5\% \text{ or } 0.015$

$P(t) = 16000(1+0.015)^t$

5. 3 years $t = 3$

$P(3) = 16000(1+0.015)^3$

$P(3) = 16730.854 \approx 16731$

6. 5 years

$P(5) = 16000(1+0.015)^5$

$P(5) = 17236.54406$

≈ 17237

7. 50 years

$P(50) = 16000(1+0.015)^{50}$

$P(50) = 33683.87873$

≈ 33684

Morristown has a population of 18,000. Its population is decreasing at a rate of 1.2%. Write a function to represent the population as a function of time. Determine the population after a given number of years. Round your answer to the nearest whole number.

Function: $P(t) = P(1-r)^t$

$P = 18000$ $r = 1.2\% \text{ or } 0.012$

$P(t) = 18000(1-0.012)^t$

8. 5 years

$P(5) = 18000(1-0.012)^5$

$P(5) = 16945.61082$

≈ 16946

9. 10 years

$P(10) = 18000(1-0.012)^{10}$

$P(10) = 15952.98478$

≈ 15953

10. 25 years

$P(25) = 18000(1-0.012)^{25}$

$P(25) = 13310.55364$

≈ 13311