

8th Grade Assignment – Week #20

Individual Work

- Percents & Growth **Practice Sheet #5**: Do as much as you can.
- Percents & Growth **Practice Sheet #6**: Do problems #1-8, 19-22, 26

Group Assignments:

For Tuesday:

- Help each other out with the more difficult problems from the individual work, above.

*For Thursday: **Puzzles!***

1) A Changing Choir.

A choir has 29 women and 21 men. How many women need to join the choir so that it becomes 72% women? (Assume that the number of men stays the same.)

2) Plane Tickets.

On a given flight, an airline offers two types of seats: first-class for \$500 and economy for \$300. A total of 110 tickets were sold for \$38,400. How many first-class seats were sold?

Percents & Growth – Practice Sheet #5

Note: You may use a calculator for this sheet, but write down what goes into your calculator.

Solve each problem by using the Exponential Growth Formula:

$$P = P_0(1+r)^t$$

Example: Annie puts \$100 into a savings account that earns 3% APR. What will the balance of the account be after 20 years?

Solution: P_0 (initial amount) is 100; r (rate) is 0.03; and t (years) is 20. So we put 100×1.03^{20} into the above formula and with a calculator we get \$180.61.

Note: The exponent key may be y^x or $^$, depending on the calculator.

- 1) The enrollment of a college is increasing by 15% per year. If the enrollment is currently about 3000, then what will it be after 18 years if that growth rate continues?
- 2) The population of a city is about 58,000, and is increasing by 5.6% per year. What will its population be in 10 years, if that growth rate continues?

Use the Rule of 72 to quickly answer each.

- 3) Kim's investment doubled over a ten-year period. What was her average annual rate of return during this period?
- 4) The population of a country is growing at 1.2% per year. About how long will it take the population to double?

Mixed problems.

- 5) What is 0.41% of 4390?
- 6) What is 950 increased by 75%?
- 7) What is 175% of 950?
- 8) 37 is what percent of 51?
- 9) What percentage increase is it going from 6200 up to 8866?
- 10) 71.4 is 21% of what?
- 11) 992 is 55% more than what?
- 12) What is 72 decreased by 6%?
- 13) What percentage increase is it going from 54 up to 63?
- 14) What percentage decrease is it going from 61 down to 18.3?
- 15) 24 is what percent of 2000?
- 16) 24 is what percent of 200?
- 17) 24 is what percent of 20?
- 18) What percentage increase is it going from 120 up to 300?
- 19) 5727 is 17% less than what?
- 20) 74,200 is 1.4% of what?
- 21) What percentage decrease is it going from 83 down to 75.53?
- 22) 89 is 2.8% more than what?
- 23) What do you end up at when 400 is increased by 30% and then that result is decreased by 30%?

Word Problems.

- 24) Jim makes an 8.2% commission when he sells a car. How much does he earn by selling a \$23,000 car?
- 25) Jill left a \$13.50 tip, which was 18% of the meal's price. What was the price of the meal?
- 26) A bank account has an interest rate of 6% APR. What is the percentage increase of the balance over an 8-year period?
- 27) A sweater is marked at a discounted price of \$33. If this was a 45% discount, then what was the original price?
- 28) Ellen is 80% as old as Vince. How old is Ellen if Vince is 60?
- 29) Ellen is 80% as old as Vince. How old is Vince if Ellen is 60?
- 30) Kevin has 16% more money than Dan. How much does Dan have if Kevin has \$21.75?
- 31) Kevin has 16% more money than Dan. How much does Kevin have if Dan has \$21.75?
- 32) *Challenge!*
Julie is 30 years old, which is $37\frac{1}{2}\%$ younger than Gail. What percent older than Julie will Gail be 12 years from now?

Percents & Growth – Practice Sheet #6

Note: You may use a calculator for this sheet, but write down what goes into your calculator.

Mixed problems.

- 1) What is 230 increased by 2.8%?
- 2) 53 is what percent of 66?
- 3) What percentage increase is it going from 17 up to 41?
- 4) 76.26 is 23% more than what?
- 5) 162 is 3.6% of what?
- 6) What percentage decrease is it going from 395 down to 158?
- 7) What is 8200 decreased by 93%?
- 8) 69 is 11% less than what?
- 9) What is 265% of 4300?
- 10) What is 4300 increased by 165%?
- 11) 8 is what percent of 53?
- 12) 8 is what percent of 530?
- 13) What percentage increase is it going from 536 up to 737?
- 14) 6794 is 79% of what?
- 15) 61.56 is 62% more than what?
- 16) What percentage decrease is it going from 320 down to 307.2?
- 17) What is 400 increased by 25%, and then decreased by 25%?

Use the Rule of 72 to quickly answer each.

- 18) David's savings account earns 2.4% APR. How long does it take for his money to double?
- 19) Pam's house doubled in value over an 18-year period. What was the average annual rate at which the value was increasing during that period?

Word Problems.

- 20) Joan was billed \$572.94 for a pair of skis. What was the marked price if the tax rate was 6.1%?
- 21) Jen is 185cm tall and her son, JR, is 74cm tall.
 - a) JR is what percent of Jen's height?
 - b) Jen is what percent of JR's height?
 - c) JR is what percent shorter than Jen?
 - d) Jen is what percent taller than JR?
- 22) Bob weighs 20% more than Pete. If Pete weighs 180 lb...
 - a) How much does Bob weigh?
 - b) Pete weighs what percent less than Bob?
- 23) Mike weighs 20% less than TJ. If Mike weighs 180 lb...
 - a) How much does TJ weigh?
 - b) TJ weighs what percent more than Mike?
- 24) John has 35% as much money as Dave. How much does Dave have if John has \$252?

- 25) In the year 2000, Japan had a population of 127 million with a 0.23% growth rate, and Nigeria had a population of 123 million with a 2.6% growth rate. Assuming that those growth rates continue...
 - a) What will Japan's population be in 2010?
 - b) What will Japan's population be in 2080?
 - c) What will Nigeria's population be in 2010?
 - d) What will Nigeria's population be in 2080?
 - e) What can be said about the last answer?

26) Challenge!

Depreciation is when the value of something drops. (e.g., The depreciation of a car is typically 30% in the first year.)

Sally bought a used car for \$12,000 and it depreciated at a rate of 15% annually. How much was it worth after eight years?