8th Grade Assignment – Week #18

<u>Announcement</u>! Starting in the next lecture, we will be using calculators during the lecture. Be ready!

<u>Individual Work</u>
- Percents & Growth **Practice Sheet #2**: do only problems #1-5, 7, 9, 10
- Percents & Growth **Practice Sheet #3**: Do as much as you can.

<u>Group Assignments</u>:

For Tuesday:
- Percents & Growth **Group Sheet #2**.

For Thursday: **Puzzle!**
Six 6's.
We can use six 6's to create the following expression, which equals 100.
$$(666-66) \div 6$$
Your task is to create another expression which once again consists only of six 6's, but this time is equal to exactly 1. Then create another expression (or maybe more than one) using six 6's that equals 2, then another expression that equals 3, etc. See how far you can go!

Percents & Growth − Practice Sheet #2

Do #1 to #5 in your head!

1) Convert to a percent.
   a) ⅓
   b) ¾
   c) ⅖
   d) ⅙
   e) ⅝
   f) 0.84
   g) 0.03
   h) 0.092
   i) 0.002
   j) 2.7

2) Convert to a fraction.
   a) 25%
   b) 60%
   c) 83⅓%
   d) 12½%

3) Convert to a decimal.
   a) 92%
   b) 7%
   c) 3.06%

4) What is…
   a) 10% of 673?
   b) 1% of 8643?
   c) 25% of 36?
   d) 37½% of 72,000?

5) a) 70 is what percent of 210?

   b) 860 is what percent of 8600?

   c) 15 is what percent of 25?

   d) 2800 is what percent of 3200?

   e) 6.4 is what percent of 640?

   f) 70 is 20% of what number?

   g) 800 is 16⅔% of what number?

Show your work on a separate sheet, if necessary.

6) a) What is 6% of 973?

   b) What is 250% of $60?

   c) What is 2.7% of 80,000?

   d) 13 is what percent of 18?

7) Hank is 3'4" and Bobby is 5'4".
   a) Hank is what percent of Bobby's height?

   b) Bobby is what percent of Hank's height?

8) Frank borrowed $500 from a bank at 10% APR. What does he owe, in total, after 6 years?

9) Statement: "Jeff is 30% taller than Matt."
   a) Reword the above *statement* as a straight percent statement.

   b) How tall is Jeff if Matt is 1.60m?

10) Statement: "Sales at Ball's Toy Store decreased by 35% in the last month."
   a) Reword the above *statement* as a straight percent statement.

   b) What is this month's sales if last month's sales were $48,000?

Percents & Growth − **Group Sheet #2**

Different Ways to Solve for the Base (for more difficult problems)

Example:
Joe has 37.5% as much money as Kate. How much does Kate have if Joe has $12?

The Decimal Method:
Thinking of 37.5% as a decimal, we can say that Joe has 0.375 times as much as Kate. We can then see that the opposite is also true: Kate has Joe's amount divided by 0.375. So our answer is $12 \div 0.375 = \underline{\$32}$.

The Fraction Method:
Thinking of 37.5% as a fraction, we can say that Joe has $^3/_8$ as much as Kate. So we know that the opposite is also true: Kate has $^8/_3$ as much as Joe. So our answer is: $12 \cdot {}^8/_3 = \underline{\$32}$.

The Algebra Method:
(Use this method only if you're really stuck.) We use the formula **N = P·B**, which says that a *number* (N) is a certain *percentage* (P) of a *base* (B). For this problem, N is 12, and P is $^{37.5}/_{100}$, which is more easily expressed as $^3/_8$ or as 0.375. This gives the equation: $12 = {}^3/_8 \cdot B$ or $12 = 0.375 \cdot B$ Solving either equation gives us B = $\underline{\$32}$.

1) Write down as many possible ways as you can think of to arrive at the answer for this problem.
Heather is 62½% as tall as Jennifer. How tall is Jennifer if Heather is 115cm?

2) Beth is 25% taller than Abe. (It may help to reword this statement.)
   a) How tall is Beth if Abe is exactly 5 feet tall?

   b) How tall is Abe if Beth is exactly 5 feet tall?

3) Circletown's population is increasing by 250 people per year, which is linear growth. Squareville's population is increasing at a rate of 10% per year, which is exponential growth. If both towns start with 2000 residents, then…
   a) What is the population of Circletown at the end of each year over the next eight years?

   b) What is the population of Squareville at the end of each year over the next eight years?

   c) What observations can be made about how each of the two towns have grown?

4) Use the *Growth Rate Table* (at the back of the book) to answer each of the following.
   a) On the column labeled 1.07 and the row labeled 6, we see the value 1.50073. What does this mean?

   b) How could the value 1.50073 have been calculated by hand?

   c) How could the numbers given in #4a be used to say something about a bank account?

   d) If Squareville continues to grow at 10% per year, what will its population be after 25 years?

   e) If a population grows at a rate of 8% per year, how long does it take for it to double? How long does it take to triple?

Percents & Growth − Practice Sheet #3

When possible, do it in your head, otherwise show your work on a separate sheet.

1) What is…
   a) 10% of 892?

   b) 13% of 73?

   c) 16⅔% of 7200?

   d) 80% of 15?

   e) 3.5% of 240?

   f) 400 increased by 50%?

   g) 150% of 400?

   h) 6000 decreased by 10%?

   i) 90% of 6000?

   j) 36 decreased by 75%?

   k) 25% of 36?

   l) 65.7 increased by 300%?

   m) 400% of 65.7?

2) a) 180 is what proportion of 270? (Give your answer as a fraction.)

   b) 270 is what proportion of 180?

   c) 180 is what percent of 270?

   d) 270 is what percent of 180?

   e) Going from 180 up to 270 is what percentage increase?

   f) Going from 270 down to 180 is what percentage decrease?

3) a) 18,000 is what percent of 24,000?

   b) 35 is what percent of 56?

   c) 27 is what percent of 40?

   d) 100 is what percent of 120?

   e) Going from 240 to 300 is what percentage increase?

   f) Going from 30 to 50 is what percentage increase?

   g) Going from 400 to 160 is what percentage decrease?

   h) Going from 16 to 14 is what percentage decrease?

   i) 3000 is 12½% of what number?

   j) 23 is 61% of what number?

Word Problems

4) Susan currently charges $25/hr for tutoring, but plans on raising her rates by 22%. What will her new rates be?

5) A bike originally marked at $180 is on sale at a 25% discount. What do you have to pay if there is a 6% sales tax?

6) Mary bought a house for $62,500 and sold it for $67,500. What was the percentage profit?

7) Mark bought a new car for $26,000 and sold it a year later for $18,200. What is the depreciation (loss) of the car's value, as a percentage?

8) A town's population is 132,500. If this is a 6% increase from last year, what was the population last year?

9) Use the *Growth Rate Table* to answer each of the following.
   a) Mark put $700 into a savings account at 3% APR. What will his balance be after 15 years?

   b) Blueville currently has a population of 3000 and is growing at 5% per year. What will its population be after 10 years?