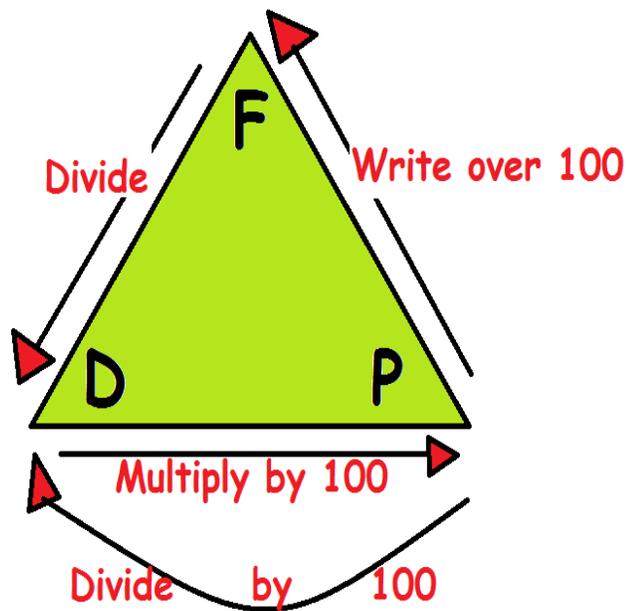


7A Unit 3: Percent's and Proportions.

Name: _____

Class: _____



Math Formula Sheet

Percent Increase or Decrease: $\frac{\text{Difference}}{\text{Original (start)}}$

Percent Error: $\frac{\text{Difference}}{\text{Actual (What you should get)}}$

Scale Factor: $\frac{\text{Larger Unit (Feet)}}{\text{Smaller Unit (Inch)}}$ **Example:** 12 Feet per inch

Solving For Model or Actual: $\frac{\text{Larger Unit}}{\text{Smaller Unit}} = \frac{\text{Scale Factor}}{1}$

Interest: $I = PRT$

When solving for R **convert to a %**

When substituting in for R **convert to a decimal**

Current Balance/Bank Account Balance = **Interest + Principal**

Discount: The Item's Cost is under a 100%.

20% is the actual discount on the item. **Expression = .20x**

80% is what you paid for the item after the discount. **Expression = .80x**

Commission: Discounts are applied first. **NO COMMISSION ON TAX.**

40% commission on all sales (x). **Expression: .40x**

Increased current commission by 30%. **Expression: 1.30x**

Markup: The profit a stores earns off the sales of their products. $\frac{\text{Retail}}{\text{Wholesale}} = \frac{\text{Retail \%}}{100\%}$

The population increased by 35%. **Expression: 1.35x**

Current membership 200, increased by 29%. **Expression: 200(1.29)**

Markup Percent: Retail % - 100%

Markup Percent: 150 % - 100% = 50%

Markup amount: Retail Price - Wholesale Price

Macys bought a shirt for \$150 and sold the same shirt for \$200. The markup or profit for the shirt is **\$50.**

Tax: Increases the cost of an item. The item costs more then 100%.

8% tax included. **Expression = 1.08x**

Unit 1: Review Questions

1. $-8 + (-8)$	2. $10 - 1 - 11 + 2$	3. $12 - (-6) * 2$
4. $16 - 2(3 - 8 * 1)$	5. $4 * -2 \div -2$	6. $-36 - 5^2 * 2$
7. $-22 - (-14) * 6$	8. $159 - (-30)$	9. $-22 + (-86)$
10. A deep-sea diver went 60 feet under the surface, and then swam up 36 feet. How many feet below the surface is the diver?	11. While playing football, Matt lost 10 yards, and then gained 28 yards, then lost 12 yards. How many yards did he gain from his three plays?	12. If you are standing at the top of a mountain 6,824 feet above sea level and there is a submarine 250 feet below sea level, how much higher is your elevation than the submarine?
13. $-6(-18 - 2 * 2)$	14. $-60 \div -3 * -2$	15. $-68 \div -2 * 4 - 1$
16. $10 * -22 + 4$	17. $-42 \div 2 + -2$	18. $-88 \div 2 - -6$
19. $-35 * 2 + -4$	20. $-6 * -2 - 10 + -4$	21. $-36 \div 4 - 100 - -2$
22. $-\frac{1}{5} \div 1\frac{1}{4}$	23. $-\frac{1}{2} \div -1\frac{3}{4}$	24. $-\frac{3}{2} * 1\frac{4}{7}$
25. $-1\frac{1}{5} \div 2$	26. $-2 \div -3\frac{4}{5}$	27. $\frac{1}{9} \div -1\frac{1}{3}$
28. $-1\frac{7}{10} \div -2\frac{1}{4}$	29. $1\frac{2}{5} \div -4\frac{3}{4}$	30. $-1\frac{1}{4} * \frac{1}{6} + -\frac{1}{4}$
31. $-1\frac{2}{3} * 1\frac{1}{4} + -2.5$	32. $-2 + -\frac{3}{7}(2)$	33. $-2\frac{2}{3} * -1\frac{1}{9}$
34. $-2\frac{1}{5} * -1\frac{1}{6} - -.5$	35. $-1\frac{1}{5} * -2$	36. $-3\frac{5}{6} * -1\frac{1}{2}$
37. $-2\frac{3}{8} * -6\frac{1}{2}$	38. $-1\frac{1}{2}(-2\frac{1}{4} - -\frac{1}{8})$	39. $-3\frac{1}{2}(-1\frac{1}{3} - \frac{1}{2})$
40. $-2\frac{1}{2}(-1\frac{1}{4} * -2)$	41. $-1\frac{1}{6} * -1\frac{1}{2} - (2 * -1)$	42. $-2\frac{1}{4} * (-1\frac{1}{8} - -.25 * 2)$
43. $9 - 3(7 + -12 * 5)$	44. $11 - 3(-9 + -11 * 5)$	45. $\frac{3(-2)(-6)}{(-2)(12)}$
46. $(3 * -4) + 4 - (6 \div -2)$	47. $(8 * -2) + 8 - (4 * -2 - 1)$	48. Find the distance if the temperature started at 80°F and dropped to -20°F.
49. Find the distance if the temperature started at -10°F and dropped to -40°F.	50. Find the distance if the temperature started at 80°F and dropped to -10°F.	51. Find the distance if the temperature started at 90°F and dropped to -11°F.
52. $\frac{-2(3-6)}{-5(8-12)}$	53. $\frac{1}{4} + (-\frac{4}{6} - \frac{1}{12})$	54. $12.22 \div -2 - 20.84$
55. $-\frac{1}{2}(\frac{4}{9} - \frac{1}{3})$	56. $-\frac{1}{2} - (-\frac{1}{4} - \frac{1}{3})$	57. $-\frac{1}{2}(\frac{2}{4} - \frac{1}{8})$
58. $-\frac{1}{2} - (\frac{2}{3} - -\frac{1}{3})$	59. $-\frac{1}{2} \div \frac{1}{4} - \frac{1}{4}$	60. $-\frac{1}{2}(\frac{1}{4} - \frac{1}{8})$

Unit 2: Review Questions

61. $-\frac{1}{5}x = 1\frac{1}{4}$	62. $-\frac{1}{2}x = -1\frac{3}{4}$	63. $\frac{1}{8}m = 1\frac{4}{7}$
64. $-1\frac{1}{5}p = 2$	65. $2k = 3\frac{4}{5}$	66. $\frac{1}{9}m = -1\frac{1}{3}$
67. $1\frac{7}{10}x = -2\frac{1}{4}$	68. $1\frac{2}{5}x = -4\frac{3}{4}$	69. $1\frac{1}{4}m = -\frac{1}{4}$
70. Solve for x: $\frac{4}{15} = \frac{52}{x}$	71. Solve for x: $\frac{88}{x} = \frac{2}{3}$	72. Solve for x: $\frac{35}{70} = \frac{5}{x}$
73. Solve for x: $\frac{3}{9} = \frac{x}{108}$	74. Solve for x: $\frac{12}{40} = \frac{x}{20}$	75. Solve for x: $\frac{40}{80} = \frac{x}{-20}$
76. Is $\frac{24}{140}$ proportional to $\frac{30}{176}$?	77. Is $\frac{4}{7}$ proportional to $\frac{52}{104}$?	78. Is $\frac{10}{60}$ proportional to $\frac{120}{130}$?
79. Is $\frac{8}{36}$ proportional to $\frac{16}{72}$?	80. Find MPH: $1\frac{3}{4}$ mi in $1\frac{1}{6}$ hr	81. Find MPH: $2\frac{3}{5}$ mi in 14 hr
82. Find COP: 12 cans for \$24.36	83. Find COP: 40 pages in 50 min	84. Find COP: 22 pens for \$123.2
85. Find COP: $\frac{1\frac{1}{4} \text{ MILES}}{2\frac{1}{5} \text{ HOURS}}$	86. Find COP: $\frac{2\frac{1}{2} \text{ MILES}}{2\frac{1}{6} \text{ HOURS}}$	87. Find COP: $\frac{1\frac{1}{4} \text{ MILES}}{2\frac{3}{8} \text{ HOURS}}$
88. Find COP: $\frac{1\frac{1}{2} \text{ MILES}}{2\frac{3}{6} \text{ HOURS}}$	89. Find COP: $\frac{\frac{1}{8} \text{ PAGES}}{1\frac{3}{9} \text{ HOURS}}$	90. Find COP: $\frac{2\frac{1}{2} \text{ PAGES}}{1\frac{3}{6} \text{ HOURS}}$

Aim: How do we calculate percent increase and decrease?

Warm up: How do you convert a decimal into a percent?

Homework: **Finding Percent Increase or Decrease**

Find the percent increase or decrease from 36 to 45.

This is a percent increase.

$$45 - 36 = 9$$

First find the amount of change.

$$\frac{\text{amount of increase}}{\text{original amount}} \rightarrow \frac{9}{36}$$

Set up the ratio.

NOTES:

$$\frac{9}{36} = 0.25 = 25\%$$

Find the decimal form. Write as a percent.

From 36 to 45 is a 25% increase.

- **Percent Increase:** a percent change in which something _____ in value.
- **Percent Decrease:** a percent change in which something _____ value.

Formula: $\frac{\text{Difference}}{\text{Original}} * 100$

Problem 1: Martha's bakery started with 100 cupcakes in the morning. After a busy afternoon there were only 20 cupcakes left. By what percent did the cupcake inventory drop?

Problem 2: The sides of a square are doubled. What is the percent increase of the area of the new square?

Part B: If the original side of the square is 15, what is the percent increase in the perimeter of the new square? Justify.

Problem 3: The enrollment at IS 73 increased from 1,500 students to 2,000 students in 2018. If the enrollment for 2019 was expected in increase by 15 percent, what is the percent increase in enrollment?

Problem 1: The enrollment at a university increased from 14,000 students to 16,000 students over a 5-year period. What is the percent increase in enrollment?

Problem 2: The attendance at a local football game went down from 2,000 people to 1,500 people. What was the percent decrease in attendance?

Problem 3: Foot Locker starts to track the number of calls received each month. Information about the number of calls in the first 3 months are listed below.

- 1st Month: 4264 calls
- 2nd Month: 25% more calls than in the first month
- 3rd Month: 6396 calls

What is the percent increase from the 2nd month to the 3rd month? Justify how you arrived at your answer.

Problem 4: The table below shows the number of scooters sold at a store during a three-year period.

Year	Number Sold
1	725
2	579
3	696

In year 4, the store sold 112% of the total scooters sold during the previous 3 years combined. What percent did the number of scooters sold increase by from year 1 to year 4?

Problem 5: Sara purchased a concert ticket on a web site. The original price of the ticket was \$75. She used a coupon code to receive a 20% discount. The web site applied a 10% service fee to the discounted price. Jeanette's ticket was less than the original price by what percent?

Problem 6: The profits of QRS which were \$50,000 rose 10% from March to April, then dropped 20% from April to May, then rose 50% from May to June. Calculate the percent increase in profits from the beginning of the quarter to end of the quarter?

Part B: How would the percent increase change if they were calculated after May? Justify.

Aim: How do we calculate percent error?

Warm up: How do you convert a percent into a decimal?

Homework:

NOTES:

- **Percent Error**: How _____ a measurement is.
- **Actual**: what your _____ should be.

Formula: $\frac{\text{Difference}}{\text{Actual}} * 100$

$$\text{percentage error} = \frac{|\text{approximate value} - \text{exact value}|}{\text{exact value}} \times 100$$

% ERROR

wikiHow

Problem 1: Britney recorded the weight of 20-pound cement bag to be 30 pounds. What is the percent error in her measurement?

Problem 2: Mary found the width of a 4-foot piece of lumber to be 4.5 feet. What is the percent error in her measurement?

Part B: John said the percent error was 11.1 %. What mistake did John make? Justify.

Problem 3: A blueprint of a house recorded the ceiling height as 24 feet. After a home inspection a contractor measured the height of the ceiling to be 20 feet. Calculate the percent error in the measurement of the ceiling height.

Problem 1: Mike found the volume of a 50-liter container to be 65 liters. What is the percent error in his measurement?

Problem 2: Nicole found the density of nickel to be 5.6 grams. The reference book stated the density of nickel was 6.4 grams. The percent error of Nicole's measurement is 14.3%. Was the percent error calculated correctly? Justify your answer using mathematical terminology.

Problem 3: Officer Reilly pulled Danny over for speeding. He was traveling 65 mph in a 55 mph zone. What is the percent error in his speed?

Problem 4: John is doing a science experiment for school and determined the boiling point of ethyl alcohol to be 75°C. The boiling point of ethyl alcohol should be 85°C. Calculate the percent error in John's experiment.

Problem 5: A group of mountain climbers started the day at an elevation of 250 feet below sea level. Every hour, they climbed 78 feet until they reached the peak of the mountain, which was 5,250 feet above sea level. Danny calculated 67 hours of hiking for the climbers to reach the peak of the mountain. Find the percent error in Danny's calculations.

Problem 6: Morgan has $40\frac{1}{15}$ grams of nitrate to conduct an experiment. This experiment requires $\frac{2}{5}$ gram of nitrate be added to the soil bed each day. At this rate she calculated the maximum number of days she could run the experiment to be $16\frac{2}{75}$. Calculate the percent error in her calculations.

Aim: How do we calculate discounts and taxes? (Day 1)

Warm up: Where have you seen discounts in real life?

Homework:



NOTES:

- **Discount:** Discounts _____ the original price.
- **Sales Price:** What you pay after the **discount** has been _____.
- **Taxes:** Taxes _____ the sales price.

Sales Price: Original Price * 1 – Discount Percent in Decimal Form

Purchase/ Final Price: Sales Price * 1 + Tax Percent in Decimal Form

Problem 1: Peter bought a North Face jacket for \$220.00. He had a coupon for 20% off his bill. What is the sales price of the jacket?

Problem 2: A truck was posted online for \$25,000 plus tax. If the sales tax in NJ were 8.5%, how much would a NJ resident expect to pay?

Part B: Danny said the expression to calculate the purchase price is $1.085 + 25,000$. Do you agree with him? Justify.

Problem 3: Matthew was looking to buy a Jeep for around \$35,000. After haggling with the sales representative Matthew received a 15% discount. The tax rate for Nassau County residents was 8.5%. How much did Matthew purchase his Jeep for?

Problem 1: Peter bought a pair of sneakers for \$150. There was a 20% discount and an 8% tax.

1. What is the discount amount?
2. What is the sales price?
3. What is the tax amount?
4. What is the purchase price?

Problem 2: Tammy bought a pair of boots for \$125. There was a 15% discount and a 6% tax.

1. What is the discount amount?
2. What is the sales price?
3. What is the tax amount?
4. What is the purchase price?

Problem 3: Danny and Danielle have to get their cars repaired. The initial cost of each repair is \$1000. They have 2 coupons to use towards the cost of the repairs. One coupon is \$80 off the cost and the other is 15% off the cost.

- Danny uses the \$80 off first then applies the 15% off the remaining balance
- Danielle uses the 15% off first then applies the \$80 off the remaining balance.

Who paid the least amount for their repairs and by how much less?

Problem 4: A new iPhone with 128G of memory cost \$899. AT&T offered new customers a 4% discount. NYS then charged their customers an 8% tax.

1. What expression could be used to solve for the purchase price.
2. How much would a new iPhone cost?
3. Danny paid \$5.95 in shipping how does this affect the answer?

Problem 5: GAP was running a sale *buy 2 shirts get the 3rd for 50% off*. Dana bought three shirts that were \$59.96 each. A sales tax of 7.12% was applied to the total purchase. How much did one shirt cost? Justify your answer.

Part B: GAP Outlets were selling the same shirts for \$59.96. The outlets were running a sale 15% off your total purchase. Which store would you shop at if the sales tax remained the same? Justify your answer.

Problem 6: The Table below shows the price per pound of several food items in a store. Grant buys 2.5 lbs. of beef, 3 lbs. of yogurt, 2 lbs. of bananas and 3.3 lbs. of cookies. If Grant had a coupon for 20% off the price per pound of bananas and paid 8.5% in sales tax, how much did he spend at the store?

Item	Price per pound
Cookies	\$4.22
Bananas	\$1.25
Yogurt	\$5.23
Beef	\$11.88

Aim: How do we calculate discounts and taxes? (*Day 2*)

Warm up: Are discounts applied before tax is added to a bill?

Homework:

NOTES:

- $\text{Discount} = \text{Original} * (\text{Discount } \%)$ in decimal form.
- $\text{Sales Price} = \text{Original} * (100\% - \text{Discount } \%)$ in decimal form
- $\text{Purchase Price} = \text{Sales Price} * (100\% + \text{Tax Percent})$



Problem 1: Mike went shopping at Macy's and bought a jacket for \$120.00. He had a 20% off coupon and paid 8.6% in tax. How much was the final price of Mike's coat?

Problem 2: Jimmy bought a new watch at the apple store. The retail of the watch was \$450.00. He had a 15% off coupon and paid 8% in sales tax. How much did Jimmy pay for the watch?

Part B: Jimmy found the watch online for \$440 including tax. Which store would you advice Jimmy to shop at? Justify

Problem 3: Kim went holiday shopping. She bought an iPad for \$500, and a MacBook for \$1,000. She received a 10% student discount and paid 8.5% in sales tax. How much was her final bill?

Problem 1: Susan bought a pair of boots for \$250 and a scarf for \$375. There was a 10% discount and a 6.7% tax.

1. What is the discount amount?
2. What is the sales price?
3. What is the tax amount?
4. What is the purchase price?

Problem 2: Helen bought a pair of jeans for \$225 and rain boots for \$275. There was a 25% discount and an 8.6% tax.

1. What is the discount amount?
2. What is the sales price?
3. What is the tax amount?
4. What is the purchase price?

Problem 3: Emma bought a shirt for \$47.50 and a jacket for \$299.99. Emma had a coupon for 25% off her purchase and paid 7.5% in sales tax.

1. What expression could be used to solve for the purchase price.
2. How much did Emma Spend at the mall?

Problem 4: Dana bought 3 shirts and a belt. Each shirt cost the same amount and the belt cost \$85.75. The total Dana paid was \$162.25 before a 7.6 % sales tax was added.

1. If a 15% discount was applied to each shirt, how much did one shirt cost including tax?
2. How much did Dana Spend at the mall?

Problem 5: Mr. Chaput and Mr. Wang want to buy sneakers for 14 players on their basketball team.

- Dick's Sporting Goods is offering a 20% discount on each pair of sneakers, which were originally priced at \$74.50. A 6.5% sales tax will be applied to the discounted price.
- Modell's has shoes for \$56.75. A 9% processing fee will be applied then a shipping fee of \$6.99 per pair.

What is the difference in total cost between the two stores for 14 pairs of sneakers? Which store would you recommend? Justify your answer.

Problem 6: Bradley's car was totaled from an accident. He received a 10% discount to replace his car from Ford. If he purchased a \$35,000 car and paid 8% in sales tax, how much was the final price of his car?

Part B: Bradley's insurance company sent him a check for \$31,500. Will he have enough money to purchase the car? Justify your answer.



Aim: How do we calculate commission?

Warm up: How does a discount affect commission?

Homework:

NOTES:

- Discounts are applied _____
- Taxes do not affect _____



Problem 1: Peter earns a 12% commission on his total sales. Peter sold a car for \$24,000 and charged his customer 8.875 % in sales tax. How much commission did he earn?

Problem 2: Mary earns a 6% commission on every house she sells. She listed a house for \$405,000 on Zillow. If the buyer received a 15% discount, how much commission did Mary earn?

Part B: Would Mary be better off lowering her commission rate to 4% and not giving a discount or giving a discount of 20% and keeping her commission rate at 6%? Justify

Problem 3: Nick earns a 6% commission on his total sales. To prevent from losing a \$30,000 sale he gave his customer a 15% discount on a car. An 8.976% sales tax was added to the sales price of the car.

1. How much did Nick earn in commission?
2. What is the final price of the car?

Problem 1: Mike listed a house for \$500,000 on Zillow. After negotiating with the seller the buyer received a 15% discount. If Mike earns a 6% commission on his sales, how much commission did Mike make?

Problem 2: Ashley showed her client a \$35,000 car. Her client received a new customer discount of 10%. If Ashley earns an 8% commission on this sell, how much commission did Ashley make?

Problem 3: Westbury Jeep listed a Dodge Demon for \$85,000 online. After several offers the Demon sold for 25% more than the original list price. If the sales representative earned a 5.5% commission off the increased purchase price, how much commission did they gain from the original list price?

Problem 4: Jax listed his boat for sale online for \$22,000. After several weeks he received an offer that included a 12% discount. If Jax accepted the discounted offer, how much commission did he lose if his commission rate was 8.5%?

Problem 5: Sienna earns the same commission rate on all sales she makes each month. Last month, she earned \$750 in commission on \$9,000 in sales. In the first half of the month, Sienna made \$6,400 in sales. How much more in sales must she make in order to earn \$1,000 in commission?

Problem 6: Each sales associate at an electronic store has a choice of two salary options shown below.

- \$140 per week plus a 6.5% commission on the associate's total sales.
- \$450 per week no commission.

The average sales amount for each associate is \$120,000. Based on this average, what is the difference between the two salary options each year? Justify.

Marked Price and Cost Mark Up

Aim: How do we solve for markups?

Warm up: What is a wholesale price?

Homework:

NOTES:

Markup: Proportional increase from _____ price to _____ price.

- Wholesale Percent: _____
- Retail Percent: _____
- **Tax and discounts are applied after the markup has been applied to the item.**

$$\text{Marked Price (MP)} = \text{Cost Price (CP)} \times (100\% + \text{Mark Up}\%)$$

CP = \$1000  Mark Up = 80%  MP

$$\text{MP} = \text{CP} \times (100 + \text{Mark Up } \%)$$
$$\text{MP} = \$1000 \times (100 + 80\%)$$
$$\text{MP} = 1000 \times (180 / 100) = \$1800 \checkmark$$

$$\frac{\text{Retail Price}}{\text{Wholesale Price}} = \frac{\text{Retail } \%}{\text{Wholesale } \%}$$

Problem 1: Bob's bought a couch for \$250. If Bob's adds a 30% markup to the couch, how much did Bob's sell the couch for?

Problem 2: JCPenney's purchased a chair for \$850. After a 35% markup was added to the chair a 15% discount was then applied. Write an expression to represent the sales price of the chair.

Part B: How was the price of the chair affected by the discount?

Problem 3: The following expressions represent the price of a pair of headphones at two different stores.

- **Store A:** $.90(1.20h)$
- **Store B:** $.95(1.10h)$

If the headphones (h) cost \$150.00, which store would you advice Danny to shop at? Justify your answer using mathematical terminology.

Problem 1: Marshall's purchased a chair online for \$350. After a 25% markup and a tax of 8.65% was added to the price of the chair, create an expression to represent the sales price of the chair?

Part B: Could your expression be $(1.3365 * 350)$? Justify.

Problem 2: Amazon was having a Cyber Monday sale. All headphones were on sale for \$299.99, including a 14% markup. What price did Amazon buy the headphone for?

Part B: Create an expression to represent the sales price after a 25% discount and a tax of 8.75% was applied to the order.

Problem 3: Colin sold iPhone chargers on his website. He bought each charger for \$65 and included a 40% markup. During Black Friday the chargers were 40% off. How much did Colin sell the chargers for on Black Friday?

Part B: Create an expression to represent the sales price.

Problem 4: Colin sold Beats on his website. He bought each set of headphones for \$155.55 and included a 63% markup on each pair of headphones he sold. Calculate the selling price of a pair of headphones after an 8.5% tax was added. (*round to the nearest dollar*)

Problem 5: Steven receives a 6.5% commission on the sales price of every car he sells. The dealership Steven works for paid \$30,000 for a car at an auction. The next day Steven sold the car for 20% more than the dealership paid. How much commission did Steven earn on the selling price of the car? Justify.

Problem 6: A rectangular walkway has a length of ten feet and a width of 6 feet. If the length and width of the walkway were expanded by 25%, how could you use your knowledge of markup to find the area of the increased walkway? Justify your answer.

Part B: What is the area of the increased walkway?

Simple Interest Formula

Aim: How do we use $I=PRT$ to solve for unknown values (*Day 1*)?

Warm up: Where have you seen interest rates in real life?

Homework:

NOTES:

Principal: _____ balance.

Rate: The Interest _____ earned.

- Convert to a **decimal** when **plugging into formula**
- Convert to a **percent** when **solving for rate.**

Ending Balance:

- **Original balance + Interest Earned = Ending Balance.**

$$I = P \times R \times T$$

Where:

I = the interest earned in dollars

P = the “principal” starting amount of money

R = the interest rate per year
(*in decimal form*)

T = the time the money is invested or
borrowed (*in years*)

Problem 1: Anna deposited \$1,000 into her investment account, yielding a 6% annual interest for 8 years. How much interest did she earn?

Problem 2: Sara invested \$3,000 6 years ago and earned \$540 on her initial investment. What interest rate did Sara receive on her initial investment?

Part B: Should Sara keep her money at her current bank or switch to Chase for 10 years and 2%?

Problem 3: Sofia deposited \$5,000 15 years ago at a rate of 8%. What is Sofia’s bank account balance after the 15 years?

Problem 1: Mary deposited \$150 dollars into her bank account for 8 years at a rate of 6.5 percent. How much interest did he earn?

Problem 2: Dawn deposited \$1,000 into her bank account 5 years ago and earned \$400 in interest. What rate did Dawn receive 5 years ago?

Problem 3: Nicole deposited \$2,500 and earned \$2,925 in interest after 13 years. How much would Nicole have in her bank account after the 13 years?

Problem 4: Jason went to Wells Fargo to deposit \$10,535. He received 7.5 percent for 10 years.

1. How much interest did Jason earn after 10 years?
2. What percent did Jason account increase by?

Problem 5: Walter's Deli had \$125,000 in their checking account, by May 1st the amount decreased by 8%. After losing money Walter's Deli deposited half of their checking account balance into a CD earning 9.5% for ten years. How much did they earn on their deposit? Justify your answer.

Problem 6: Tim has \$20,000 to invest, which bank would you recommend? Justify your answer.

- Chase: Offers a CD which yields 8 percent for 12 years
- TD: Offers a Money market which yields 5 percent for 20 years



Aim: How do we use $I=PRT$ to solve for unknown values (*Day 2*)?

Simple Interest Formula

Warm up: How would a high interest rate on a loan affect the borrower?

$$I = P \times R \times T$$

Homework:

Where:

I = the interest earned in dollars

P = the "principal" starting amount of money

R = the interest rate per year
(*in decimal form*)

T = the time the money is invested or
borrowed (*in years*)

NOTES:

Rate: _____ earned.

Interest: _____ earned.

Ending Balance: Original balance + Interest Earned = Ending Balance.

Problem 1: Caitlyn invested \$5,000 at a rate of 12.5% for 5 years. How much interest did she earn?

Problem 2: Peter put \$400 in a savings account. The account earns \$40 in simple interest over 4 years. What is the annual interest rate?

Part B: Peter wants to invest his money into a risky 401k plan consisting of mostly stocks. What advise would you give Peter on his investment?

Problem 3: Morgan deposited \$1,500 at a rate of 3.5% for 48 months. What is her bank account balance in 48 months?

Problem 1: Carlos invests \$5,000 at a rate of 3.5% per year. After 4 years, how much interest will he earn?

Problem 2: Patrick deposited \$2,400 two years ago and earned \$144 in interest. What rate did Patrick receive?

Problem 3: If Mary invests \$2,500 at a rate of 2.5%, what will her bank account balance be after 36 months?

Problem 4: Andrew went to Bank of America to deposit \$15,546. He received 8.5 percent for 10 years. What is Andrew's bank account balance after 10 years?

Problem 5: Iverone had \$145,000 in their checking account, by March 1st the amount increased by 12%. To diversify their portfolio Iverone deposited 75% of their savings into a money market earning 6.75% for 12 years. How much did they earn on their deposit? Justify your answer.

Problem 6: The amounts in four investment accounts and the interest rates the accounts are earning are shown in the table below.

Account	Principal (\$)	Interest Rate (%)
A	850	1.8
B	900	1.6
C	700	2.1
D	750	1.9

If no additional money were deposited in any of these accounts, which account would earn the most interest in 36 months? Justify.



Aim: How do we use proportions to solve percent problems (*Day 1*)?

Warm up: How do you calculate the retail percent?

Homework:

NOTES:

Using a Proportion

$$\frac{\text{Discount Amount/ Bill Including Tax}}{\text{Original Amount (Total)}} = \frac{\text{Discount \% / Retail \% / Tip\% / Bill \%}}{100\%}$$

Problem 1: Danny went to Friday's with his friends for dinner. His bill was \$240, which included a 15.5% tip. How much was his bill before tip was added?

Problem 2: Mrs. Prettitore earns \$44 per hour tutoring. In January she received a raise earning \$55 per hour. What percent raise did Mrs. Prettitore receive?

Part B: What percent of a raise would Mrs. Prettitore need to earn to make \$80 an hour?

Problem 3: Kim bought a sweater on sale for \$30. The original price of the sweater was \$50. What percent discount did Kim receive on the sweater?

Part B: How could you solve this problem another way?

Problem 1: Danielle went to Chili's with her friends for dinner. Her bill was \$230, which included a 9.5% tax. How much was her bill before tax was added?

Problem 2: Mike offered a salesperson \$2,200 for a couch. The offer included an 8.5% tax. How much was the couch before tax was added?

Problem 3: Sara went to dinner with her mom. After dinner her mom left a \$32 tip, which was 21% of their total bill. How much was their bill before tip was added?

Problem 4: 90 students were surveyed about their favorite video game, the results are shown below. What percent of students chose Halo as their favorite game?

- 26 Call Of Duty
- 34 Halo
- 30 Mortal Kombat

Problem 5: In total they earned \$5,220. After putting 25% into their savings account for their monthly expenses. They divided the rest of the money proportionally based on the number of hours worked.

Part A: How much money did Tom earn?

Part B: If they decided to save 30% would this affect your answer? Justify your answer using mathematical terminology.

Name	Hours Worked
Tom	$18\frac{1}{4}$
Danny	$22\frac{1}{4}$
John	$8\frac{1}{4}$

Problem 6: Mary receives a 12% commission on every car she sells. The dealership paid \$40,000 for a car from an auction. The next day they listed the car for 30% more then their purchase price. After a few days on the lot a customer negotiated a deal for 15% off the list price and a 7.75% tax was applied.

Part A: How much did the customer pay for the car?

Part B: How much did Mary earn in commission? Justify your answer.

Aim: How do we use proportions to solve percent problems (*Day 2*)?

Warm up: How do you calculate the final price as a percent?

Homework:

NOTES:

Using a Proportion

$$\frac{\text{Discount Amount/ Bill Including Tax}}{\text{Original Amount (Total)}} = \frac{\text{Discount \% / Retail \% / Tip\% / Bill \%}}{100\%}$$

Problem 1: Danny went to the Cheesecake Factory with his friends for dinner. His bill was \$340, which included a 20% tip and a sales tax of 8.56%. How much was his bill before tip and tax were added?

Problem 2: A total of 80 students in Jaxson's school are taking Italian, which is 30% more than last year. How many students took an Italian last year?

Part B: If the number of students taking Italian decreased by 30% would the amount of students taking Italian remain the same as this year? Justify.

Problem 3: Brooks Brothers applied a 30% markup to all \$200 suits. On Black Friday customers received a 30% off coupon. If a customer bought 5 suits, how much is their final bill including an 8.5% tax?

Problem 1: Danielle went to Chili's with her friends for dinner. Her bill was \$130, which included a 22.5% tip. How much was her bill before tip was added?

Problem 2: After a 15% discount a shirt was on sale for \$48.50. How much was the shirt before the discount was applied?

Problem 3: Sara only has \$20 to spend at a restaurant. In addition to the cost of her meal she must pay an 8.5% sales tax and leave a 15% tip. What is the maximum amount Sara can pay her meal?

Problem 4: A 100 gym members were surveyed about their favorite gym class, the results are shown below. What percent of gym members chose Spinning as their favorite gym class?

- 36 Spinning
- 34 Zumba
- 30 Kick Boxing

Problem 5: A subscription for a magazine was \$29.99 for 12 issues. The subscription included a 45% discount.

Part A: How much did one magazine cost before the discount was applied?

Part B: If a 25% markup were applied to each magazine before the discount was applied, how much more would one magazine cost after the markup was applied? Justify your answer.

Problem 6: Mary receives a 15% commission on every car she sells. The dealership paid \$50,000 for a car from an auction. The next day they listed the car for 28% more than their purchase price. After a few days on the lot a customer negotiated a deal for 22% off the list price and an 8.75% tax was applied.

Part A: How much commission did Mary lose?

Part B: If Mary's commission were based of the difference in the list price and auction price, by what percent would her commission drop? (*round to the nearest tenth*) Justify.



