



مدارس التكنولوجيا التطبيقية
Applied Technology Schools

ATS-Al Hili Campus
MATHEMATICS
Grade 7 Advanced
Math End of Term 1
Exam Booklet
Coverage materials
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Name: _____

Student ID: _____

Section: _____

Module 1 Proportional Relationships

L1.1 rates involving ratios and fractions

Find unit rates when one or both quantities are fractions.

1) A truck driver drove 48 miles in 45 minutes. At this rate, how many miles can the truck driver drive in one hour?

$$45 \text{ min} = \frac{3}{4} \text{ h}$$

$$48 \times \frac{4}{3} = 64 \text{ mile in 1 hour}$$

or

mile	:	min	
48		45	
x		60	

$$\Rightarrow x = \frac{60 \times 48}{45} = 64 \text{ miles}$$

2) Russell runs $\frac{9}{10}$ mile in 5 minutes. At this rate, how many miles can he run in one minute?

$$\frac{9}{10} \times \frac{1}{5} = \frac{9}{50} \text{ mile in 1 minute}$$

3) A small airplane flew 104 miles in 50 minutes. At this rate, how many miles can it fly in one hour? (50 minutes = $\frac{5}{6}$ hour)

$$104 \times \frac{6}{5} = 124.8 \text{ miles in 1 hour}$$

4) DeAndre downloaded 8 apps onto his tablet in 12 seconds. At this rate, how many apps could he download in one minute?

(12 seconds = $\frac{1}{5}$ minute)

$$8 \times \frac{5}{1} = \frac{40}{1} = 40 \text{ apps in 1 minute.}$$

5) In Lixue's garden, the green pepper plants grew 5 inches in $\frac{3}{4}$ month. At this rate, how many feet can they grow in one month?

(Let 5 inches = $\frac{5}{9}$ foot)

$$\frac{5}{9} \times \frac{4}{3} = \frac{20}{27} \text{ feet in 1 month.}$$

6) Thunder from a bolt of lightning travels $\frac{1}{10}$ mile in $\frac{1}{2}$ second. At this rate, how many miles can it travel in one second?

$$\frac{1}{10} \times \frac{2}{1} = \frac{2}{5} \text{ mile in 1 second.}$$

7) The average sneeze can travel $\frac{3}{100}$ mile in 3 seconds. At this rate, how far can it travel in one minute? (3 seconds = $\frac{1}{20}$ minute)

$$\frac{3}{100} \times \frac{20}{1} = \frac{60}{100} = 0.6 \text{ mile in one minute.}$$

8) Multiselect Anita is making headbands for her softball team. She needs a total of $\frac{3}{4}$ yard of fabric. Select all types of fabric that cost less than \$8 per yard.

- ☒ cotton
- ☒ flannel
- ☒ fleece
- ☒ terry cloth

Fabric	Total Cost for $\frac{3}{4}$ Yard (\$)
Cotton	5.54
Flannel	2.62
Fleece	4.27
Terry Cloth	6.52

$$\begin{aligned} &\times \frac{4}{3} = 7.39 \$ \\ &\times \frac{4}{3} = 3.49 \$ \\ &\times \frac{4}{3} = 5.69 \$ \\ &\times \frac{4}{3} = 8.69 \$ \end{aligned}$$

L1.2 understanding proportional relationships

Use models and ratio reasoning to understand how a proportional relationship can exist between quantities.

1. A salad dressing calls for 3 parts oil and 1 part vinegar. Manuela uses 2 tablespoons of vinegar and 6 tablespoons of oil to make her salad dressing.

$$\frac{\text{oil}}{\text{vinegar}} : \frac{3}{1} \quad \text{proportional}$$
$$: \frac{6}{2} = \frac{3}{1}$$

3. A saltwater solution for an aquarium calls for 35 parts salt to 1000 parts water. Tareq used 7 tablespoons of salt and 200 tablespoons of water.

$$\text{Salt: Water} \xrightarrow{\div 5} 7:200$$
$$35:1000 \xrightarrow{\div 5} 7:200$$

equivalent ratios so it's proportional.

5. A tectonic plate in Earth's crust moves at a constant rate of 4 centimeters per year. In a different part of the world, another tectonic plate moves at a constant rate of 30 centimeters in ten years.

$$\text{cm: year}$$
$$4:1 \xrightarrow{\div 10} 3:1$$
$$30:10 \xrightarrow{\div 10} 3:1$$

Not proportional

2. A specific shade of orange paint calls for 2 parts yellow and 3 parts red. Catie uses 3 cups of yellow paint and 4 cups of red paint to make orange paint.

$$\text{yellow: red}$$
$$2:3$$
$$3:4 \quad \text{Not equivalent ratios}$$

so it is Not proportional

4. A conveyor belt moves at a constant rate of 12 feet in 3 seconds. A second conveyor belt moves 16 feet in 4 seconds.

$$\text{feet: second}$$
$$12:3 \xrightarrow{\div 3} 4:1$$
$$16:4 \xrightarrow{\div 4} 4:1$$

proportional

6. A strand of hair grows at a constant rate of $\frac{1}{2}$ inch per month. A different strand of hair grows at a constant rate of 4 inches per year. = 12 months

$$\text{inch: month}$$
$$\frac{1}{2}:1 \xrightarrow{\div 12} \frac{1}{3}:1$$
$$4:12 \xrightarrow{\div 12} \frac{1}{3}:1$$

Not proportional

or $\frac{\text{inch}}{\text{month}} : \frac{\frac{1}{2}}{1} = \frac{1}{2}, \frac{4}{12} = \frac{1}{3}$

7. **Multiselect** One blend of garden soil is 1 part minerals, 1 part peat moss, and 2 parts compost. Select all of the mixtures below that are in a proportional relationship with this blend.

given ratio 1:1:2

- ☒ 5 ft³ minerals, 5 ft³ peat moss, 10 ft³ compost $\xrightarrow{\div 5} 1:1:2$
- ☒ 10 ft³ minerals, 15 ft³ peat moss, 15 ft³ compost $\xrightarrow{\div 5} 2:3:3$
- ☒ 12 ft³ minerals, 12 ft³ peat moss, 24 ft³ compost $\xrightarrow{\div 12} 1:1:2$
- ☒ 20 ft³ minerals, 20 ft³ peat moss, 40 ft³ compost $\xrightarrow{\div 20} 1:1:2$
- ☒ 100 ft³ minerals, 100 ft³ peat moss, 200 ft³ compost $\xrightarrow{\div 100} 1:1:2$
- ☒ 50 ft³ minerals, 50 ft³ peat moss, 50 ft³ compost $\xrightarrow{\div 50} 1:1:1$

L1.3 Tables of Proportional Relationships

Determine whether two quantities shown in a table are in a proportional relationship by testing for equivalent ratios.

For each situation, complete the table given. Does the situation represent a proportional relationship? Explain.

1. The cost of a school lunch is \$2.50.

Lunches Bought	1	2	3	4
Total Cost (\$)	2.5	5	7.5	10

$$\frac{2.5}{1} = 2.5 \quad \frac{7.5}{3} = 2.5$$

$$\frac{5}{2} = 2.5 \quad \frac{10}{4} = 2.5$$

Proportional

2. Anna walks her dog a constant rate of 12 blocks in 8 minutes.

Number of Blocks	12	24	36	48
Number of Minutes	8	16	24	32

$$\frac{8}{12} = \frac{2}{3} \quad \frac{24}{36} = \frac{2}{3} \quad \text{proportional}$$

$$\frac{16}{24} = \frac{2}{3} \quad \frac{32}{48} = \frac{2}{3}$$

3. Fun Center rents popcorn machines for \$20 per hour. In addition to the hourly charge, there is a rental fee of \$35.

Hours	1	2	3	4
Cost (\$)	20	40	60	80
Final cost	55	75	95	105

$$\frac{55}{1} = 55 \quad \frac{75}{2} = 37.5$$

Not proportional

4. Jean has \$280 in her savings account. Starting next week, she will deposit \$30 in her account every week.

Weeks	1	2	3	4
Savings (\$)	30	60	90	120
Final Savings	310	340	370	400

$$\frac{310}{1} = 310 \quad \frac{340}{2} = 170$$

Not proportional

5. Rocko paid \$12.50 for 25 game tickets. Louisa paid \$17.50 for 35 game tickets. What is the constant of proportionality for cost per ticket?

A. 2 B. $\frac{1}{2}$ C. 3 D. $\frac{1}{3}$

$$k = \frac{y}{x} = \frac{12.50}{25} = \frac{1}{2} \text{ \$ per ticket}$$

6. A baker, in 70 minutes, iced 40 cupcakes and, in 49 minutes, iced 28 cupcakes. What is the constant of proportionality for minutes per cupcake?

A. 4 B. $\frac{4}{7}$ C. 7 D. $\frac{7}{4}$

$$k = \frac{y}{x} = \frac{40}{70} = \frac{4}{7}$$

7. The table shows the amount of dietary fiber in bananas. Use the table to find the constant of proportionality for grams of fiber per banana.

Dietary Fiber (g)	9.3	18.6	27.9	37.2
Bananas	3	6	9	12

A. 3 B. 9.3 C. $\frac{10}{31}$ D. $\frac{31}{10}$

$$k = \frac{9.3}{3} = \frac{23}{30} = \frac{31}{10} = 3.1g$$

8. **Open Response** The table shows the distance travelled by a runner. Use the table to find the constant of proportionality for miles per hour.

Distance (mi)	4.55	13.65	22.75	31.85
Time (h)	0.5	1.5	2.5	3.5

$$k = \frac{4.55}{0.5} = \frac{45.5}{5} = 9.1 \text{ miles per hour.}$$

L1.5 equation of proportional relationship
Write equations to represent proportional relationships.

1. Liv earns \$9.50 for every two bracelets she sells. The equation $y = 4.75x$, where x represents the number of bracelets and y represents the total cost in dollars earned, represents this situation. What is the constant of proportionality? What does the constant of proportionality represent in the context of the problem?

$k = 4.75$
 $4.75 \$ \text{ per bracelet.}$

2. John ran 3 miles in 25.2 minutes. The equation $y = 8.5x$, where x represents the number of miles and y represents the total time in minutes, represents this situation. What is the constant of proportionality? What does the constant of proportionality represent in the context of the problem?

$k = 8.5$
 $8.5 \text{ min in 1 mile.}$

3. Lincoln bought 3 bottles of an energy drink for \$4.50. Write an equation relating the total cost y to the number of energy drinks bought x .

- A. $y = 3x$ B. $y = 2x$
 C. $y = 1.5x$ D. $y = 4.5x$

$k = \frac{y}{x} = \frac{4.50}{3} = 1.5$

4. The total cost of renting a cotton candy machine for 4 hours is \$72. What equation can be used to model the total cost y for renting the cotton candy machine x hours?

- A. $y = 72x$ B. $y = 4x$
 C. $y = 18x$ D. $y = 0.05x$

$k = \frac{y}{x} = \frac{72}{4} = 18$

5. Marley used 7 cups of water to make 4 loaves of French bread. What equation can be used to model the total cups of water needed y for making x loaves of French bread? How many cups of water do you need for 6 loaves of French bread?

- A. 10 B. 10.5 C. 11 D. 11.5

x : loaves
 y : cups
 $y = \frac{7}{4}x$
 $x = 6 \Rightarrow y = \frac{7}{4} \times 6 = 10.5 \text{ cups}$
 $k = \frac{y}{x} = \frac{7}{4}$

6. Mrs. Henderson used $6\frac{3}{4}$ yards of fabric to make 3 elf costumes. What equation can be used to model the total number of yards of fabric y for x costumes? How many yards of fabric do you need for 7 elf costumes?

- A. 15.75 B. 15.5 C. 15.25 D. 15

y : yard
 x : Customer
 $y = 2.25x \Rightarrow x = 7$
 $y = 2.25 \times 7 = 15.75 \text{ yards}$
 $k = \frac{y}{x} = \frac{6.75}{3} = 2.25$

7. **Multiselect** The table shows the cost of 4 movie tickets at two theaters. Select the statements that are true about the situation.

Theater	Cost (\$)
Movies Galore	30
Star Cinema	31

$\rightarrow k = \frac{30}{4} = 7.5$

$\rightarrow k = \frac{31}{4} = 7.75$

- ☒ The equation $y = 7.75x$ models the cost for tickets at Star Cinema.
☒ The equation $y = 30x$ models the cost for tickets at Movies Galore.
☒ The total cost of 9 tickets at Star Cinema would cost \$69.75
☒ The total cost for 1 ticket at Movies Galore is \$30.

L1.6 Solve Problems Involving Proportional Relationships

Solve problems involving proportional relationships by making a table, using a graph, or writing an equation.

For each problem, use any method. Assume each relationship is proportional.

1. For every three girls taking classes at a martial arts school, there are 4 boys who are taking classes. If there are 236 boys taking classes, predict the number of girls taking classes at the school.

A. 177 B. 150 C. 137 D. 120

girls: boys

$$\begin{array}{cc} 3 & 4 \\ x & 236 \end{array} \Rightarrow x = \frac{3 \times 236}{4} = 177$$

2. A grading machine can grade 96 multiple choice tests in 2 minutes. If a teacher has 300 multiple choice tests to grade, predict the number of minutes it will take the machine to grade the tests.

A. 6 B. 6.25 C. 8 D. 8.5

choice: min

$$\begin{array}{cc} 96 & 2 \\ 300 & x \end{array} \Rightarrow x = \frac{2 \times 300}{96} = 6.25 \text{ min}$$

3. A 6-ounce package of fruit snacks contains 45 pieces. How many pieces would you expect in a 10-ounce package?

A. 60 B. 65 C. 70 D. 75

ounce: pieces

$$\begin{array}{cc} 6 & 45 \\ 10 & x \end{array} \Rightarrow x = \frac{10 \times 45}{6} = 75 \text{ pieces}$$

4. Of the 50 students in the cafeteria, 7 have red hair. If there are 750 students in the school, predict the number of students who have red hair.

A. 105 B. 115 C. 120 D. 135

red hair: students

$$\begin{array}{cc} 7 & 50 \\ x & 750 \end{array} \Rightarrow x = \frac{750 \times 7}{50} = 105$$

5. The wait times for two different rides are shown in the table. If there are 120 people in line for the swings, how long can you expect to wait to ride the ride?

Ride	Wait Times
Carousel	6 minutes for 48 people in line
Swings	12 minutes for 75 people in line

min: people

$$\begin{array}{cc} 12 & 75 \\ x & 120 \end{array} \Rightarrow x = \frac{120 \times 12}{75} = 19.2 \text{ min}$$

6. Open Response Ingrid types 3 pages in the same amount of time that Tanya types 4.5 pages. If Ingrid and Tanya start typing at the same time and continue at their respective rates, how many pages will Tanya have typed when Ingrid has typed 11 pages?

Tanya: Ingrid
4.5 3
x 11

$$x = \frac{11 \times 4.5}{3} = 16.5 \text{ pages}$$

7. The wait time to ride a roller coaster is 20 minutes when 160 people are in line.

How long is the expected wait time when 240 people are in line?

Assume the relationship is proportional.

time: people

$$\begin{array}{cc} 20 & 160 \\ x & 240 \end{array} \Rightarrow x = \frac{240 \times 20}{160} = 30 \text{ min.}$$

8. The ratio of kids to adults at a school festival is 11 : 7. Suppose there are a total of 810 kids and adults at the festival. How many adults are at the festival?
A. 45 B. 495 C. 315 D. 110

kids: adult

$$11 : 7 \rightarrow 11 + 7 = 18$$

$$\text{all} = 810$$

$$810 \div 18 = 45$$

$$45 \times 11 = 495 \text{ kids}$$

$$45 \times 7 = 315 \text{ adults.}$$

9. The ratio of laptops to tablets in the stock room of a store is 13 : 17. If there are a total of 90 laptops and tablets in the stock room, how many laptops are in the stock room?

Laptop : tablet

$$13 : 17 \rightarrow 13 + 17 = 30$$

$$\text{all} = 90$$

$$90 \div 30 = 3$$

$$3 \times 13 = 39 \text{ laptops, } 3 \times 17 = 51 \text{ tablets}$$

10. **Persevere with Problems** Lisa is painting the exterior surfaces at her home. A gallon of paint will cover 350 square feet. How many gallons of paint will Lisa need to paint one side of her fence? Explain how you solved.

Item to Paint	Length (ft)	Width (ft)
Fence	26	7
Barn Door	11	6

$$\text{area of Fence} = 26 \times 7 = 182 \text{ ft}^2$$

$$\text{area of Door} = 11 \times 6 = 66 \text{ ft}^2$$

$$\text{total area} = 182 + 66 = 248 \text{ ft}^2$$

gallon : ft²

$$1 \quad 350$$

$$x \quad 248$$

$$x = \frac{248 \times 1}{350} = 0.71 \text{ gallon.}$$

11. **Find the Error** The rate of growth for a plant is 0.2 centimetres per 0.5 day. A student found the number of days for the plant to grow 3.6 centimeters to be 1.44 days. Find the error and correct it.

cm : day

$$0.2 \quad 0.5$$

$$3.6 \quad x \quad x = \frac{0.5 \times 3.6}{0.2} = 9 \text{ days}$$

he is wrong.

Module 2 Solve Percent Problems

L2.1 Percent of Change

Use proportional relationships to solve percent of change problems.

Find each percent of change. Identify it as a percent of increase or decrease.

1. 8 feet to 10 feet

$$\frac{10-8}{8} \times 100 = 25\%$$

increasing by 25%

2. 62 trees to 31 trees

$$\frac{31-62}{62} \times 100 = -50\%$$

decreasing by 50%

3. 136 days to 85 days

$$\frac{85-136}{136} \times 100 = -37.5\%$$

decreasing by 37.5%

4. Last month, the online price of a powered ride-on car was \$250. This month, the online price is \$330. What is the percent of increase for the price of the car?

A. 30% B. 32% C. 34% D. 40%

$$\frac{330-250}{250} \times 100 = 32\%$$

5. At end of the first half of a football game, Nathan had carried the ball for 50.5 yards. By the end of the game, he carried the ball for a total of 75 yards. Find the percent of increase in the number of yards he carried. Round to the nearest whole tenth if necessary.

A. 44.5% B. 46.5% C. 48.5% D. 50%

$$\frac{75-50.5}{50.5} \times 100 = 48.5\%$$

6. A music video website received 5,000 comments on a new song they released. The next day, the artist performed the song on television and an additional 1,500 comments were made on the website. What was the percent of increase?

A. increased by 70% B. decreased by 70%
C. increased by 84% D. increased by 30%

$$\frac{6500-5000}{5000} \times 100 = 30\%$$

7. When Ricardo was 9 years old, he was 56 inches tall. Ricardo is now 12 years old and he is 62 inches tall. Find the percent of increase in Ricardo's height to the nearest tenth.

$$\frac{62-56}{56} \times 100 = 10.7\%$$

8. At a garage sale, Petra priced her scooter for \$15.50. She ended up selling it for \$10.75. Find the percent of decrease in the price of the scooter. Round to the nearest tenth if necessary.

A. 30.6% B. 32.5% C. 34.4% D. 40.8%

$$\frac{10.75-15.50}{15.50} \times 100 = -30.6\%$$

9. At the beginning of a baking session, there were 2.26 kilograms of flour in the bag. By the end of the baking session, there was 0.98 kilogram of flour in the bag. What is the percent of decrease, rounded to the nearest tenth, for the amount of flour?

$$\frac{0.98-2.26}{2.26} \times 100 = -56.6\%$$

decreasing by 56.6%

10. **Open Response** The table shows the number of candid pictures of students for the yearbook for two consecutive years. What was the percent of decrease in the number of candid student pictures from 2015 to 2016, rounded to the nearest tenth?

$$\frac{214-236}{236} \times 100$$

$$= -9.2\%$$

decreasing by 9.2%

Year	Number of Photos
2015	236
2016	214

L2.2 Tax

Use proportional relationships to find the amount of tax charged for an item

Find the total cost to the nearest cent.

1. \$18 breakfast; 7% tax

$$18 \times \frac{7}{100} = \frac{126}{100} = 1.26 \text{ Tax}$$

$$\text{total cost} = 18 + 1.26 = 19.26\$$$

2. \$24 shirt; 6% tax

$$\frac{6}{100} \times 24 = \frac{144}{100} = 1.44$$

$$24 + 1.44 = 25.44\$$$

3. \$49.95 pair of shoes; 5% tax

$$\frac{5}{100} \times 49.95 = 2.4975\$$$

$$49.95 + 2.4975 = 52.4475 \approx 52.4\$$$

4. Emily wants to buy new boots that cost \$68. The sales tax rate in her city is $5\frac{1}{2}\%$. What is the total cost for the boots?

A. 71 B. 71.4 C. 71.74 D. 72

$$\frac{5.5}{100} \times 68 = \frac{374}{100} = 3.74$$

$$68 + 3.74 = 71.74$$

5. Jack wants to buy a coat that costs \$74.95. The sales tax rate in his city is $6\frac{1}{2}\%$. What is the total cost for the coat? Round to the nearest whole dollar.

A. 78 B. 79 C. 80 D. 81

$$\frac{6.5}{100} \times 74.95 = 4.87175$$

$$\begin{aligned} \text{total cost} &= 74.95 + 4.87175 \\ &= 79.82175 \\ &\approx 80\$ \end{aligned}$$

6. Mr. Phuong stayed in a hotel room for 2 nights that cost \$210. The hotel room tax rate in the city is 12%. What is the total cost for the hotel room?

A. 230 B. 232.5 C. 234 D. 235.2

$$\frac{12}{100} \times 210 = 25.2 \text{ tax}$$

$$\begin{aligned} \text{total cost} &= 210 + 25.2 \\ &= 235.2\$ \end{aligned}$$

7. The cost of a hotel room during Lacy's trip is \$325. The hotel room tax in the city she is in is 10.5%. What is the total cost of the hotel room?

A. 330 B. 340.7 C. 350 D. 359.125

$$\frac{10.5}{100} \times 325 = 34.125$$

$$\begin{aligned} \text{total cost} &= 325 + 34.125 \\ &= 359.125\$ \end{aligned}$$

8. Robert spends \$30.45 before tax at the bookstore. If the sales tax rate in his city is 7.25%, what is the total cost of his purchase?

$$\frac{7.25}{100} \times 30.45 = 2.21$$

$$\begin{aligned} 30.45 + 2.21 &= 32.66\$ \\ \text{total cost} & \end{aligned}$$

9. **Multiple Choice** Anya purchased \$124.35 worth of home improvement items at the hardware store. If the sales tax rate in her city is 6.75%, what is the total cost of her purchase?

A \$131.10

B \$8.39

C \$115.96

D \$132.74

$$\frac{6.75}{100} \times 124.35$$

$$= 8.39$$

$$124.35 + 8.39 = 132.74\$$$

L2.4 Discount

Use proportional relationships to find the amount of discount or markdown.

Find the sale price to the nearest cent. Use any strategy.

1. \$140 coat; 10% discount

$$\frac{10}{100} \times 140 = 14$$

$$140 - 14 = 126\$$$

2. \$80 boots; 25% discount

$$\frac{25}{100} \times 80 = 20$$

$$80 - 20 = 60\$$$

3. \$325 tent; 15% discount

$$\frac{15}{100} \times 325 = 48.75$$

$$325 - 48.75 = 276.25\$$$

4. A toy store is having a sale. A video game system has an original price of \$99. It is on sale for 40% off the original price. Find the sale price of the game system. Round to the nearest cent.

A. 55 B. 57.5 C. 59.1 **D. 59.4**

$$\frac{40}{100} \times 99 = 39.6$$

$$99 - 39.6 = 59.4$$

5. A yearly coffee club subscription costs \$65. Avery received an offer for 62% off the subscription cost. What is the sale price of the subscription? Round to the nearest cent.

A. **24.7** B. 31.4 C. 38.74 D. 42

$$\frac{62}{100} \times 65 = 40.3$$

$$65 - 40.3 = 24.7$$

6. During a clearance sale at a sporting goods store, skateboards were marked down 30%. On Saturday, an additional 25% was taken off already reduced prices of skateboards. If a skateboard originally cost \$119.50, what was the final price after all discounts had been taken? Round to the nearest cent.

$$\frac{30}{100} \times 119.5 = 35.85 \rightarrow 119.5 - 35.85 = 83.65$$

$$\frac{25}{100} \times 83.65 = 20.9125$$

$$83.65 - 20.9125 = 62.7375 \approx 62.7\$$$

7. At an electronics store, a smart phone is on sale for 35% off the original price of \$679. If you use the store credit card, you can receive an additional 15% off the sale price. What is the final price of the smart phone if you use the store credit card? Round to the nearest cent.

$$\frac{35}{100} \times 679 = 237.65 \rightarrow 679 - 237.65 = 441.35$$

$$\frac{15}{100} \times 441.35 = 66.2$$

$$441.35 - 66.2 = 375.15$$

$$\approx 375.2\$$$

8. Gary had a 40% discount for new tires. The sale price of a tire was \$96.25. What was the original price of the tire? Round to the nearest cent.

A. 103 B. 105 **C. 106.4** D. 108.3

$$100 - 40 = 60\%$$

$$\frac{60}{100} = \frac{96.25}{x} \Rightarrow x = \frac{96.25 \times 100}{60}$$

$$x = 160.4\$$$

9. A swimsuit is on sale for \$45.50. If the sale price is discounted 5% from the original price, what was the original price? Round to the nearest cent.

A. 46.8 B. 47 **C. 47.9** D. 48

$$100 - 5 = 95\%$$

$$\frac{95}{100} = \frac{45.50}{x} \Rightarrow x = \frac{45.50 \times 100}{95}$$

$$x = 47.9\$$$

10. **Open Response** A shoe store is having a clearance sale on their summer shoes. All summer shoes are marked 55% off. A sign states you can take an additional 10% off the clearance sale prices. Kelly is deciding between two pairs of sandals shown in the table. If she buys the blue sandals, what is the final price Kelly will pay? Round to the nearest cent.

Shoes	Original Price
Blue Sandals	\$75
Tan Sandals	\$68

$$\frac{55}{100} \times 75 = 41.25 \text{ first discount}$$

$$75 - 41.25 = 33.75$$

$$\frac{10}{100} \times 33.75 = 3.375 \text{ second discount}$$

$$33.75 - 3.375 = 30.375$$

$$\approx 30.4\$$$

L2.5 interest

Use the simple interest formula to find the amount of interest earned for a given principal, at a given interest rate, for a given period of time. $I = p.r.t$

Find the simple interest earned, to the nearest cent, for each principal, interest rate, and time.

1. \$650, 5%, 1 year

$$\begin{aligned} I &= p.r.t \\ &= 650 \times \frac{5}{100} \times 1 \\ &= 32.5 \$ \end{aligned}$$

2. \$340, 4%, 1 year

$$\begin{aligned} I &= p.r.t \\ &= 340 \times \frac{4}{100} \times 1 \\ &= 13.6 \$ \end{aligned}$$

3. \$1,100, 2.5%, 2 years

$$\begin{aligned} I &= p.r.t \\ &= 1100 \times \frac{2.5}{100} \times 2 \\ &= 11 \times 5 = 55 \end{aligned}$$

4. \$975, 1.5%, 2 years

$$\begin{aligned} &975 \times \frac{1.5}{100} \times 2 \\ &= \frac{975 \times 3}{100} = 29.25 \end{aligned}$$

5. \$850, 6%, 3 years

$$\begin{aligned} &850 \times \frac{6}{100} \times 3 \\ &= \frac{15300}{100} = 153 \$ \end{aligned}$$

6. \$980, 8%, 4 years

$$\begin{aligned} &980 \times \frac{8}{100} \times 4 \\ &= \frac{31360}{100} = 313.6 \$ \end{aligned}$$

7. Megan opened a savings account with a \$500 deposit. The account pays 1.25% simple interest each year. If she neither adds nor withdraws money from the account, how much interest will she earn after 3 years?

A. 18.75 B. 20 C. 22.25 D. 25

$$\begin{aligned} I &= p.r.t = 500 \times \frac{1.25}{100} \times 3 \\ &= 18.75 \$ \end{aligned}$$

8. Mr. Pharm put \$1,550 into a savings account. The account pays 3.5% simple interest on an annual basis. If he does not add or withdraw money from the account, how much interest will he earn after 2 years?

A. 101.3 B. 105.6 C. 107 D. 108.5

$$\begin{aligned} I &= p.r.t = 1550 \times \frac{3.5}{100} \times 2 \\ &= \frac{10850}{100} = 108.5 \$ \end{aligned}$$

9. Hannah deposited \$650 into a savings account. The account pays 1.75% simple interest on an annual basis. If she does not add or withdraw money from the account, how much interest will she earn after 4 years?

A. 42.5 B. 43.5 C. 44.5 D. 45.5

$$\begin{aligned} I &= p.r.t = 650 \times \frac{1.75}{100} \times 4 \\ &= \frac{4550}{100} = 45.5 \$ \end{aligned}$$

10. Mrs. Taylor put \$3,550 into a savings account. The account pays 2.5% simple interest each year. If she neither adds nor withdraws money from the account, how much interest will she earn after 2 years?

A. 171 B. 175.5 C. 176.74 D. 177.5

$$\begin{aligned} I &= p.r.t = 3550 \times \frac{2.5}{100} \times 2 \\ &= \frac{17750}{100} = 177.5 \$ \end{aligned}$$

L2.7 Error Percent

Use proportional relationships to solve percent error problems.

1. Doug estimates that his soccer team will win 7 games this year. The team actually wins 10 games. What is the percent error of Doug's estimate? Round the answer to the nearest tenth percent, if necessary.

- A. 70% B. 50% C. 30% D. 10%

$$\text{error} = 10 - 7 = 3$$

$$\frac{3}{10} = \frac{x}{100} \Rightarrow x = \frac{100 \times 3}{10} = 30\%$$

3. Maya estimates that the wait time for her favorite roller coaster is 35 minutes. The actual wait time is 55.5 minutes. What is the percent error of Maya's estimate? Round the answer to the nearest tenth of a percent, if necessary.

$$\text{error} = 55.5 - 35 = 20.5$$

$$\frac{20.5}{55.5} = \frac{x}{100} \Rightarrow x = \frac{100 \times 20.5}{55.5}$$

$$x = 36.9\%$$

5. A jar of marbles should contain 100 marbles. The jar actually has 99 marbles. What is the percent error to the nearest hundredth of a percent?

- A. 10.01% B. 5.1% C. 1.01% D. 1%

$$\text{error} = 100 - 99 = 1$$

$$\frac{1}{99} = \frac{x}{100} \Rightarrow x = \frac{100 \times 1}{99} = 1.01\%$$

7. The table shows the predicted and actual amount of snow for a local city. What is the percent error for the amount of snowfall? Round the answer to the nearest tenth of a percent if necessary.

$$\text{error} = 10.25 - 6.75 = 3.5$$

Snowfall (Inches)	
Predicted	6.75
Actual	10.25

$$\frac{3.5}{10.25} = \frac{x}{100} \Rightarrow x = \frac{100 \times 3.5}{10.25} = 34.1\%$$

2. A mayor estimates that 4,000 people will attend the first day of the county fair. A total of 8,400 people actually attend the first day of the fair. What is the percent error of the mayor's estimate? Round the answer to the nearest tenth percent, if necessary.

- A. 52.4% B. 55% C. 57.3% D. 59%

$$\text{error} = 8400 - 4000 = 4400$$

$$\frac{4400}{8400} = \frac{x}{100} \Rightarrow x = \frac{100 \times 4400}{8400} = 52.4\%$$

4. Oliver estimates the weight of his cat to be 16 pounds. The actual weight of his cat is 14.25 pounds. What is the percent error of Oliver's estimate rounded to the nearest tenth of a percent?

- A. 11.3% B. 12.3% C. 13.3% D. 14.3%

$$\text{error} = 16 - 14.25 = 1.75$$

$$\frac{1.75}{14.25} = \frac{x}{100} \Rightarrow x = \frac{100 \times 1.75}{14.25} = 12.3\%$$

6. A cyclist estimates that he will bike 80 miles this week. He actually bikes 75.5 miles. What is the percent error of the cyclist's estimate rounded to the nearest hundredth of a percent?

$$\text{error} = 80 - 75.5 = 4.5$$

$$\frac{4.5}{75.5} = \frac{x}{100} \Rightarrow x = \frac{100 \times 4.5}{75.5} = 5.96\%$$

8. **Multiple Choice** Jin's mother estimates there is a half gallon of fruit punch remaining in the container. There is actually 72 ounces of fruit punch in the container. What is the percent error of Jin's mother's estimate, rounded to the nearest tenth?

- A. 11.1%

- B. 36%

- C. 88.9%

- D. 144%

$$\frac{1}{2} \text{ gallon} = 64 \text{ ounce}$$

$$72 - 64 = 8 \text{ error}$$

$$\frac{8}{72} = \frac{x}{100}$$

$$x = \frac{100 \times 8}{72} = 11.1\%$$

Module 3 Operations with Integers

L3.1 Add integers

Use different methods, including algebra tiles, number lines, or absolute value, to add integers.

1. $-3 + (-8) = -11$

2. $-11 + (-13) = -24$

3. $9 + (-35) = -26$

4. $-28 + 14 = -14$

5. $-22 + (-10) + 15$
 $\quad \quad \quad -32 + 15 = -17$

6. $18 + (-12) + 5$
 $\quad \quad \quad +6 + 5 = +11$
 $\quad \quad \quad \text{or } 11$

7. Roger owes his father \$15. He borrows another \$25 from him. What integer represents the balance that he owes his father?

- A. 40 B. -40 C. 10 D. -10

$$-15 - 25 = -40$$

8. A football team lost 14 yards on their first play then lost another 7 yards on the next play. What integer represents the total change in yards for the two plays?

- A. -21 B. 21 C. 7 D. -7

$$-14 - 7 = -21$$

9. Kwan's beginning account balance was \$20. His ending balance is \$0. What integer represents the change in his account balance from beginning to end?

$$-20 \$$$

L3.2 Subtract integers

Use different methods, including algebra tiles, number lines, or the additive inverse, to subtract integers.

1. $9 - (-2) = 9 + 2 = 11$

2. $-20 - 10 = -30$

3. $13 - (-63) = 13 + 63$
 $\quad \quad \quad = 76$

4. $28 - 14 = 14$

5. $-10 - 0 = -10$

6. $-33 - 33 = -66$

7. $-18 - (-12)$

$$-18 + 12 = -6$$

8. $-28 - (-13)$

$$-28 + 13 = -15$$

9. $-18 - (-40)$

$$-18 + 40 = +22$$

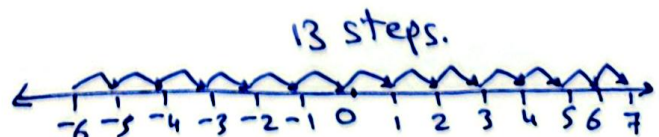
10. Evaluate $a - b$ if $a = 10$ and $b = -7$.

- A. 3 B. -3 C. 17 D. -17

$$10 - (-7) = 10 + 7 = 17$$

11. Find the distance between -6 and 7 on a number line.

- A. 1 B. 6 C. 7 D. 13



12. The highest and lowest recorded temperatures for the state of Texas are 120° Fahrenheit and -23° Fahrenheit. Find the range of these extreme temperatures.

- A. 120 B. 23 C. 97 D. 143
- $$120 - (-23)$$
- $$= 120 + 23 = 143$$

L3.3 Multiply integers

Use different methods to multiply integers.

1. $4(-7) = -28$

2. $-14(5) = -70$

3. $9(-12) = -108$

4. $-6(-8) = +48$ or 48

5. $-10(-10) = 100$

6. $-11(-13) = 143$

7. $\underbrace{7(-5)}_{-35}(4) = -140$

8. $(-8)(\underbrace{-7(3)}_{+56}) = 168$

9. $-2(\underbrace{-12(-8)}_{+24}) = -192$

10. Evaluate ab if $a = -16$ and $b = -5$.

- A. 80 B. -80 C. 75 D. -75
- $$(-16)(-5) = +80 \text{ or } 80$$

11. Evaluate $a^2 b c$ if $a = 3$, $b = -14$, and $c = -6$.

- A. 252 B. -252 C. 756 D. -756

$$(3^2) \cdot (-14) \cdot (-6) =$$
$$(9)(+84) = 756$$

12. Mrs. Rockwell lost money on an investment at a rate of \$4 per day. What is the change in her investment, due to the lost money, after 4 weeks?

- A. 16 B. -16 C. -112 D. 112

$$(-4) \cdot (28)$$
$$= -112$$

$$4 \text{ weeks} = 4 \times 7 = 28$$

days

L3.4 Divide integers

Use a related multiplication sentence to divide integers.

$$1. 22 \div (-2) = -11$$

$$2. -110 \div 11 = -10$$

$$3. 75 \div (-3) = -25$$

$$4. -64 \div (-8) = +8 \text{ or } 8$$

$$5. -39 \div (-13) = +3 \text{ or } 3$$

$$6. -50 \div (-10) = +5 \text{ or } 5$$

Evaluate each expression if $m = -32$, $n = 2$, and $p = -8$.

$$7. \frac{m}{n} = \frac{-32}{2} = -16$$

$$8. \frac{m}{p} = \frac{-32}{-8} = +4 \text{ or } 4$$

$$9. \frac{p}{n} = \frac{-8}{2} = -4$$

Module 4 Real Numbers

L4.1 Rational Numbers

Divide rational numbers.

Write each fraction as a decimal. Determine if the decimal is a terminating decimal.

$$1. \frac{5}{8} = 0.625$$

Terminating

$$2. -\frac{3}{4} = -0.75$$

terminating

$$3. \frac{2}{9} = 0.\overline{2}$$

repeating

$$4. -\frac{5}{6} = -0.8\overline{3}$$

repeating

$$5. -\frac{4}{5} = -0.8$$

Terminating

$$6. \frac{23}{50} = 0.46$$

Terminating

$$7. -\frac{9}{22} = -0.4\overline{09}$$

repeating

$$8. \frac{17}{24} = 0.708\overline{3}$$

repeating

$$9. -\frac{1}{33} = -0.\overline{03}$$

repeating

$$10. -\frac{11}{40} = -0.275$$

Terminating

$$11. \frac{7}{32} = 0.21875$$

Terminating

$$12. -\frac{3}{7} = -0.\overline{428571}$$

repeating.

13. Open Response Ms. Bradley surveyed her class about their favorite fruits. The results are shown in the table.

A. Write the fraction of students who prefer strawberries, as a decimal. Determine if the decimal is a terminating decimal.

$$\frac{9}{30} \div \frac{3}{10} = \frac{3}{10} = 0.3 \text{ terminating}$$

B. Write the fraction of students who prefer kiwis, as a decimal. Determine if the decimal is a terminating decimal.

$$\frac{1}{30} = 0.0\overline{3} \text{ repeating.}$$

Fruit	Fraction of the Class
Apples	$\frac{8}{30}$
Kiwi	$\frac{1}{30}$
Peaches	$\frac{12}{30}$
Strawberries	$\frac{9}{30}$

L4.2 Add Rational Numbers

Find the additive inverse of rational numbers+ Add rational numbers.

Find the additive inverse of each rational number.

1. $-\frac{1}{4} \rightarrow \frac{1}{4}$

2. $0.75 \rightarrow -0.75$

3. $\frac{7}{10} \rightarrow -\frac{7}{10}$

4. $-0.6 \rightarrow 0.6$

5. Rhonda earned \$32.50 mowing lawns and \$13.25 babysitting. Find the total amount she earned and describe a situation in which Rhonda would end the week with zero dollars.

$$\begin{array}{r} 32.50 \\ + 13.25 \\ \hline 45.75 \end{array} \$$$

she spent 45.75 \$ to buy a gift.
(to make it 0)

6. Travis spent \$5.50 on baseball cards and \$3.75 on a bagel sandwich. Find the total amount he spent and describe a situation in which Travis would end the day with zero dollars.

$$\begin{array}{r} 5.50 \\ + 3.75 \\ \hline 9.25 \end{array}$$

9.25 → negative value.

Add and Write in simplest form.

7. $4\frac{7}{8} + (-1\frac{1}{8})$

8. $-15\frac{1}{5} + 6\frac{3}{5}$

9. $-\frac{1}{3} + 2\frac{7}{8}$

A. $3\frac{3}{4}$ B. $4\frac{1}{8}$

A. $7\frac{1}{5}$ B. $-8\frac{3}{5}$

$$-\frac{1}{3} + \frac{23}{8} = \frac{-8}{24} + \frac{69}{24}$$

C. $2\frac{5}{8}$ D. $1\frac{1}{4}$

C. $-7\frac{2}{5}$ D. $-6\frac{4}{5}$

$$= \frac{61}{24} = 2\frac{13}{24}$$

10. $3\frac{1}{2} + (-\frac{1}{4})$

11. $-4.6 + \frac{1}{5}$

12. $\frac{2}{3} + 6.1$

A. $3\frac{3}{4}$ B. $3\frac{1}{4}$

A. -4.4 B. 4.4

$$\frac{2}{3} + \frac{61}{10} = \frac{20}{30} + \frac{183}{30}$$

C. $2\frac{3}{4}$ D. 3

C. -4.8 D. 4.8

$$= \frac{203}{30} = 6\frac{23}{30}$$

13. $-1\frac{1}{2} + 0.25 + 0.65$

14. $-0.75 + 4\frac{5}{6} + 3\frac{1}{12}$

15. $-2\frac{1}{2} + 0.8 + 6\frac{4}{5}$

A. -0.3 B. -0.6

A. $7\frac{1}{12}$ B. $-7\frac{1}{12}$

$-2.5 + 0.8 + 6.8$

C. 0.4 D. 0.5

C. $7\frac{1}{6}$ D. $-7\frac{1}{6}$

$-2.5 + 7.6 = +5.1$

or 5.1

L4.3 Subtract Rational Numbers

Subtract rational numbers by adding the additive inverse.

Subtract and write in simplest form.

1. $-2.45 - (3.9)$

$$\begin{aligned} -2.45 - 3.9 &= \\ -6.35 \end{aligned}$$

2. $5.47 - (-2.8)$

$$\begin{aligned} 5.47 + 2.8 &= \\ 8.27 \end{aligned}$$

3. $7\frac{5}{12} - (-3\frac{3}{4})$

$$\begin{aligned} 7\frac{5}{12} + 3\frac{3}{4} &= \\ \frac{89}{12} + \frac{15}{4} &= \\ &\quad (3) \\ \frac{89}{12} + \frac{45}{12} &= \frac{134}{12} \\ &= 11\frac{2}{12} = 11\frac{1}{6} \end{aligned}$$

4. $-\frac{7}{8} - (2\frac{1}{6})$

$$\begin{aligned} -\frac{7}{8} - 2\frac{1}{6} &= \\ -\frac{7}{8} - \frac{13}{6} &= \\ &\quad (3) \quad (4) \\ -\frac{21}{24} - \frac{52}{24} &= -\frac{73}{24} \\ &= -3\frac{1}{24} \end{aligned}$$

5. Evaluate $a - b$ if $a = 6\frac{1}{4}$ and $b = -7.4$. Write your answer in simplest form.

- A. 1.15 B. -1.15 C. 13.65 D. -13.65

$$6\frac{1}{4} - (-7.4) = 6.25 + 7.4 = 13.65$$

6. Evaluate $c - b$ if $c = \frac{1}{2}$ and $b = -3.5$. Write your answer in simplest form.

- A. -4 B. 4 C. 3 D. -3

$$\frac{1}{2} - (-3.5) = 0.5 + 3.5 = 4$$

L4.4+L4.5 Multiply and Divide Rational Numbers

Use the rules for multiplying integers to multiply rational numbers.

Use the rules for dividing integers to divide rational numbers.

Multiply or divide. Write the product or quotient in simplest form.

$$1. -\frac{1}{2} \left(-\frac{4}{5} \right) = \frac{2}{5}$$

$$2. 1\frac{4}{9} (-2\frac{4}{7}) = \frac{13}{9} \times -\frac{18}{7} \\ = -\frac{26}{7} = -3\frac{5}{7}$$

$$3. 1\frac{1}{10} (-6\frac{7}{8}) \\ \frac{11}{10} \times -\frac{55}{8} = -\frac{121}{16} \\ = -7\frac{9}{16}$$

$$4. -\frac{1}{6} (2.4) \\ -\frac{1}{6} \times \frac{24}{10} = -\frac{4}{10} = -0.4 \\ = -\frac{2}{5}$$

$$5. -\frac{6}{7} \div \frac{3}{14} \\ -\frac{6}{7} \times \frac{14}{3} = -\frac{4}{1} = -4$$

$$6. \frac{2}{3} \div \left(-\frac{4}{9} \right) \\ \frac{2}{3} \times -\frac{9}{4} = -\frac{3}{2} \\ = -1.5 \text{ or } -1\frac{1}{2}$$

$$7. 7\frac{1}{2} \div \left(-2\frac{5}{6} \right) \\ \frac{15}{2} \div -\frac{17}{6} = \frac{15}{2} \times -\frac{6}{17} \\ = -\frac{45}{17} = -2\frac{11}{17}$$

$$8. -3\frac{4}{9} \div \left(-2\frac{1}{3} \right) \\ -\frac{31}{9} \div -\frac{7}{3} \\ -\frac{31}{9} \times -\frac{3}{7} = \frac{31}{21} \\ = 1\frac{10}{21}$$

$$9. -5\frac{1}{4} \div \frac{7}{8} \\ -\frac{21}{4} \times \frac{8}{7} = -\frac{6}{1} \\ = -6$$

Evaluate each expression if $x = -\frac{2}{3}$, $y = 0.6$ and $z = -1\frac{7}{8}$. Write the product in simplest form.

$$10. \frac{1}{4}xy \\ \frac{1}{4} \cdot -\frac{2}{3} \cdot \frac{3}{5} = -\frac{1}{10} \\ = -0.1$$

$$11. -\frac{4}{5}xz \\ -\frac{4}{5} \cdot -\frac{2}{3} \cdot -\frac{15}{8} \\ = -1$$

$$12. -xyz \\ -\left(-\frac{2}{3}\right) \cdot (0.6) \cdot \left(-1\frac{7}{8}\right) \\ \frac{2}{3} \cdot \frac{3}{5} \cdot -\frac{15}{8} = -\frac{3}{4}$$

13. Evaluate $\frac{x}{y}$ if $x = \frac{4}{5}$ and $y = -0.1$. Write your answer in simplest form.

A. 8 B. -8 C. 4 D. -0.8

$$\frac{4}{5} \div (-0.1) = \frac{4}{5} \div -\frac{1}{10} = \frac{4}{5} \times -\frac{10}{1} = -8$$

14. Evaluate $\frac{c}{d}$ if $c = -4.75$ and $d = -1\frac{1}{4}$. Write your answer in simplest form.

A. $-3\frac{4}{5}$ B. $3\frac{4}{5}$ C. 4 D. $-4\frac{1}{4}$

$$(-4.75) \div (-1.25) = 3.8 = 3\frac{8}{10} = 3\frac{4}{5} \\ \text{or } \left(-4\frac{3}{4}\right) \div \left(-1\frac{1}{4}\right) = -\frac{19}{4} \div -\frac{5}{4} = -\frac{19}{4} \times -\frac{4}{5} = +\frac{19}{5} \\ = 3\frac{4}{5}$$

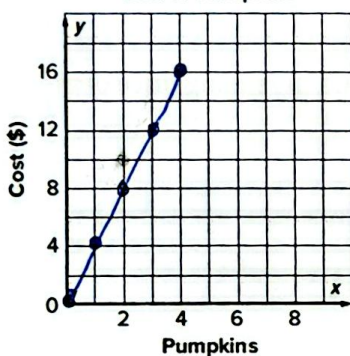
FRQ Questions:

Explain what the points (0, 0) and (1, r) mean on the graph of a proportional relationship.

1. The cost of pumpkins is shown in the table. Determine whether the cost of a pumpkin is proportional to the number bought by graphing the relationship on the coordinate plane. Explain.

Number of Pumpkins	0	1	2	3	4
Cost (\$)	0	4	8	12	16

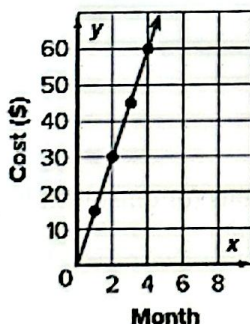
Cost of Pumpkins



it is proportional because the graph is straight line passing through origin.

3. The total cost of online streaming is proportional to the number of months. What is the constant of proportionality?

Online Streaming of TV Shows/Movies



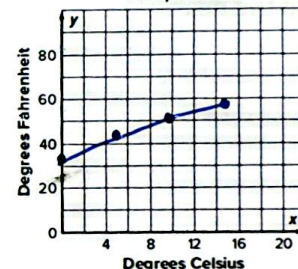
$$k = \frac{y}{x} = \frac{30}{2} = 15$$

equation is $y = 15x$

2. The table shows temperatures in degrees Celsius and their equivalent temperatures in degrees Fahrenheit. Determine whether the temperature in degrees Fahrenheit is proportional to the temperature in degrees Celsius by graphing the relationship on the coordinate plane. Explain.

Celsius (degrees)	0	5	10	15	22
Fahrenheit (degrees)	32	41	50	59	68

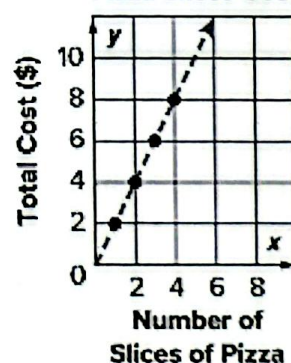
Temperature



the graph is a line but not passing through origin so it is not proportional

4. **Open Response** The cost per slice of pizza is proportional to the number of slices as shown in the graph. What do the points (0, 0) and (1, 2) represent?

Pizza Slices Cost



(0,0) for no pizza there is no payment
(1,2) each 1 slice costs 2\$.

Use proportional relationships to find the amount to pay for a tip and the amount of markup on items.

1. Vera went to the local salon to get a haircut. The cost was \$24. Vera tipped the hair stylist 18%. What was the total cost of haircut including the tip? Round to the nearest cent.

$$\frac{18}{100} \times 24 = 4.32 \text{ tip}$$

$$\text{Total Cost} = 24 + 4.32 = 28.3 \$$$

2. The Gomez family ordered \$39.50 worth of pizza and subs. They gave the delivery person a 20% tip. What was the total cost of the food and tip? Round to the nearest cent

$$\frac{20}{100} \times 39.5 = 7.9 \text{ Tip}$$

$$\text{total cost} = 39.5 + 7.9 = 47.4 \$$$

3. The wholesale cost of a bicycle is \$98.75. The markup for the bicycle is 33.3%. Find the selling price of the bicycle. Round to the nearest cent.

$$\frac{33.3}{100} \times 98.75 = 32.88375 \approx 32.88 \$ \text{ markup}$$

$$\text{Total price} = 98.75 + 32.88 = 131.63 \approx 131.6 \$$$

4. The wholesale cost for a purse in a department store is \$12.50. The store plans to mark up the purse by 140%. What will be the selling price of the purse? Round to the nearest cent.

$$\frac{140}{100} \times 12.5 = 1.75 \$ \text{ markup}$$

$$\text{Selling price} = 12.5 + 1.75 = 14.25 \approx 14.3 \$$$

5. Keri is making doll clothes for a holiday craft show. The wholesale cost of the materials for one outfit is \$9.38. If she sells an outfit for \$15, what is the percent of markup? Round to the nearest percent.

$$15 - 9.38 = 5.62 \$ \text{ mark up}$$

$$\frac{x}{100} = \frac{5.62}{9.38} \Rightarrow x = \frac{5.62 \times 100}{9.38} = 60\%$$

6. A pet store sells a large dog kennel for \$98.50. The wholesale cost of the kennel is \$63.55. What is the percent of markup? Round to the nearest percent.

$$98.50 - 63.55 = 34.95 \$ \text{ markup}$$

$$\frac{x}{100} = \frac{34.95}{63.55} \Rightarrow x = \frac{34.95 \times 100}{63.55} = 55\%$$

7. **Open Response** An elementary school wants to purchase a new swing set. The table shows the selling price of the swing sets they are interested in buying. The markup for both swing sets is $20\frac{1}{4}\%$. The school decides to buy the Adventurers swing set. What is the selling price of the swing set they are buying?

Swing Set	Wholesale Price (\$)
Adventurers	3,056
Thunder Ridge	4,125

Use the order of integer operations to evaluate expressions.

Evaluate each expression.

$$1. -5(6) + (-9)$$

$$\begin{aligned} & \underline{-30} + (-9) \\ & = -39 \end{aligned}$$

$$2. \frac{-36}{9} + (-7)$$

$$\begin{aligned} & \downarrow \\ & -4 + (-7) \\ & = -11 \end{aligned}$$

$$3. -4(-8) + (-10)$$

$$\begin{aligned} & \underline{32} + (-10) \\ & = 22 \end{aligned}$$

$$4. 2(-5)(-6) - (-12)$$

$$\begin{aligned} & \underline{60} - (-12) \\ & 60 + 12 = 72 \end{aligned}$$

$$5. 10(-3)(4) - (-15)$$

$$\begin{aligned} & \underline{-120} - (-15) \\ & -120 + 15 \\ & = -105 \end{aligned}$$

$$6. \left(\frac{-80}{4}\right) - 14$$

$$\begin{aligned} & \downarrow \\ & -20 - 14 = -34 \end{aligned}$$

Evaluate each expression if $a = -2$, $b = 3$, $c = -12$, and $d = -4$.

$$7. \frac{bd}{a} + c$$

$$\begin{aligned} & \frac{(3)(-4)}{-2} + (-12) \\ & \frac{-12}{-2} + (-12) = \\ & 6 + (-12) = -6 \end{aligned}$$

$$8. \frac{ac}{b} - (a + d)$$

$$\begin{aligned} & \frac{(-2)(-12)}{3} - [-2 + (-4)] \\ & \frac{24}{3} - (-6) \\ & 8 + 6 = 14 \end{aligned}$$

$$9. \frac{d^2}{a^2} - (c + b)$$

$$\begin{aligned} & \frac{(-4)^2}{(-2)^2} + (-12 + 3) \\ & \frac{16}{4} + (-9) \\ & 4 + (-9) = -5 \end{aligned}$$

Evaluate each expression if $m = -32$, $n = 2$, $p = -8$, and $r = 4$.

$$10. \frac{pr}{n} + m$$

$$\begin{aligned} & \frac{(-8)(4)}{2} + (-32) \\ & = \frac{-32}{2} + (-32) \\ & = -16 + (-32) \\ & = -48 \end{aligned}$$

$$11. \frac{p^2}{m} - (np + r)$$

$$\begin{aligned} & \frac{(-8)^2}{-32} - [(2)(-8) + 4] \\ & \frac{64}{-32} - (-16 + 4) \\ & -2 - (-12) \\ & -2 + 12 = 10 \end{aligned}$$

$$12. \frac{p^3}{r^2} - (m + np)$$

$$\begin{aligned} & \frac{(-8)^3}{(4)^2} + [-32 + (2)(-8)] \\ & \frac{-512}{16} + [-32 - 16] \\ & -32 + (-48) \\ & = -80 \end{aligned}$$

Add, subtract, multiply, and divide rational numbers.

Evaluate each expression if $a = \frac{7}{8}$, $b = -\frac{7}{16}$, $c = 0.8$, $d = \frac{1}{4}$. Write your answer in simplest form.

1. $\frac{a}{b} - c + d$

$$\begin{aligned} & \left(\frac{\frac{7}{8}}{-\frac{7}{16}} \right) - 0.8 + \frac{1}{4} \\ & \left(\frac{\frac{7}{8} \times \frac{16}{7}}{1} \right) - 0.8 + 0.25 \\ & -2 + 0.8 + 0.25 = -0.95 \end{aligned}$$

2. $a + b + cd$

$$\begin{aligned} & \frac{7}{8} + \left(-\frac{7}{16} \right) + (0.8) \left(\frac{1}{4} \right) \\ & \frac{14}{16} - \frac{7}{16} + \frac{4}{5} \cdot \frac{1}{4} \\ & \frac{7}{16} + \frac{1}{5} = \frac{35}{80} + \frac{16}{80} \\ & = \frac{51}{80} \end{aligned}$$

3. $c - a + \frac{b}{d}$

$$\begin{aligned} & 0.8 - \frac{7}{8} + \left(-\frac{7}{16} \div \frac{1}{4} \right) \\ & \frac{4}{5} - \frac{7}{8} + \left(-\frac{7}{16} \times \frac{4}{1} \right) \\ & \frac{4}{5} - \frac{7}{8} - \frac{7}{4} = \frac{32}{40} - \frac{35}{40} - \frac{70}{40} \\ & = -\frac{73}{40} = -1\frac{33}{40} \end{aligned}$$

4. $\frac{b}{a} + \frac{c}{d}$

$$\begin{aligned} & \left(-\frac{7}{16} \div \frac{7}{8} \right) + \left(0.8 \div \frac{1}{4} \right) \\ & \left(-\frac{7}{16} \times \frac{8}{7} \right) + \left(\frac{4}{5} \times \frac{4}{1} \right) \\ & -\frac{1}{2} + \frac{16}{5} = \frac{-5}{10} + \frac{32}{10} = \frac{27}{10} \\ & = 2\frac{7}{10} \end{aligned}$$

5. $d^2 - b$

$$\begin{aligned} & \left(\frac{1}{4} \right)^2 - \left(-\frac{7}{16} \right) \\ & \frac{1}{16} + \frac{7}{16} = \frac{8}{16} \div 8 \\ & = \frac{1}{2} \end{aligned}$$

6. $a + \frac{b}{c} - d$

$$\begin{aligned} & \frac{7}{8} + \left(-\frac{7}{16} \div \frac{4}{5} \right) - \frac{1}{4} \\ & \frac{7}{8} + \left(-\frac{7}{16} \times \frac{5}{4} \right) - \frac{1}{4} \\ & \frac{7}{8} - \frac{35}{64} - \frac{1}{4} = \frac{56 - 35 - 16}{64} \\ & = \frac{5}{64} \end{aligned}$$

Evaluate each expression if $a = \frac{7}{10}$, $b = \frac{3}{5}$, $c = -1.9$, and $d = -\frac{1}{5}$. Write your answer in simplest form.

7. $\frac{1}{2}(a - b) + c$

$$\begin{aligned} & \frac{1}{2} \left(\frac{7}{10} - \frac{3}{5} \right) + (-1.9) \\ & 0.5(0.7 - 0.6) + (-1.9) \\ & 0.5(0.1) - 1.9 = 0.05 - 1.9 \\ & = -1.85 \end{aligned}$$

8. $0.25(a + b) - d$

$$\begin{aligned} & 0.25(0.7 + 0.6) - (-0.2) \\ & 0.25(1.3) + 0.2 \\ & 0.325 + 0.2 \\ & = 0.525 \end{aligned}$$

9. $b + 0.2(c - d)$

$$\begin{aligned} & \frac{3}{5} + 0.2(-1.9 - (-\frac{1}{5})) \\ & 0.6 + 0.2(-1.9 + 0.2) \\ & 0.6 + 0.2(-1.7) \\ & 0.6 - 0.34 = -2.8 \end{aligned}$$

10. $(b + d) - a$

$$\begin{aligned} & \left[\frac{3}{5} + \left(-\frac{1}{5} \right) \right] - \frac{7}{10} \\ & \frac{2}{5} - \frac{7}{10} \\ & 0.4 - 0.7 = -0.3 \end{aligned}$$

11. $b^2 + \frac{1}{10}(d - b)$

$$\begin{aligned} & \left(\frac{3}{5} \right)^2 + \frac{1}{10} \left(-\frac{1}{5} - \frac{3}{5} \right) \\ & \frac{9}{25} + \frac{1}{10} \left(-\frac{4}{5} \right) \\ & \frac{9}{25} - \frac{4}{50} \\ & \frac{18}{50} - \frac{4}{50} \\ & \frac{14}{50} \div 2 = \frac{7}{25} \end{aligned}$$

12. $b + \frac{c}{d}$

$$\begin{aligned} & \frac{3}{5} + \left[-1.9 \div \left(-\frac{1}{5} \right) \right] \\ & \frac{3}{5} + \left[-\frac{19}{10} \times \frac{5}{1} \right] \\ & \frac{3}{5} + \frac{19}{2} = \frac{6}{10} + \frac{95}{10} \\ & = \frac{101}{10} = 10\frac{1}{10} \end{aligned}$$