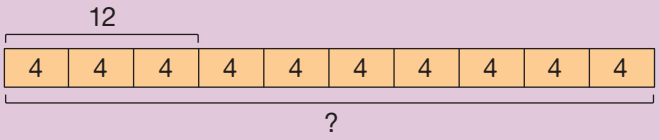
Unit 12 Reference Page

Use a Percentage to Find the Total Amount

12.6

Ex. Brynn scored 12 points at the basketball game. She scored 30% of her team's points. How many points did her team score in all?

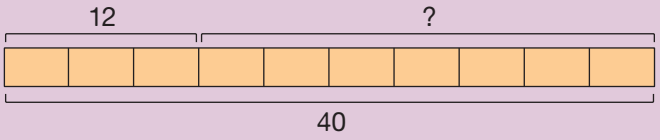


30% of what equals 12?

$12 \div 3 = 4$

$4 \times 10 =$ **40 points**

How many points did her teammates score?
What percentage of the total points did her teammates score?



$40 - 12 =$ **28 points**

$100\% - 30\% =$ **70%**

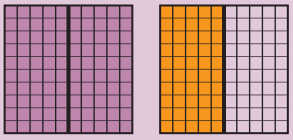
Percentages Greater Than 100%

12.7

We use percentages greater than 100% to stand for more than the original amount.

Ex. Write 150% as a mixed number.

$$150\% = \frac{150}{100} = \frac{3}{2} = \mathbf{1\frac{1}{2}}$$



Ex. What is 150% of 40?

Mental Math

100% of 40 = 40
50% of 40 = 20
40 + 20 = **60**

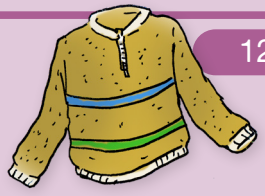
Fraction Multiplication

$1\frac{1}{2} \times 40$

$\frac{3}{2} \times 40 =$ **60**

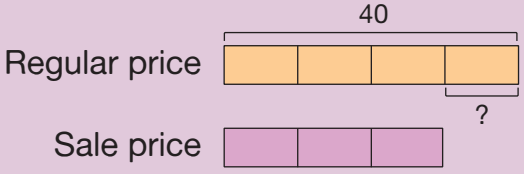
Percent Increase and Decrease Problems

12.8



Ex. The sweater's regular price is \$40. Today, the sweater is on sale for 25% off the regular price. How much does it cost?

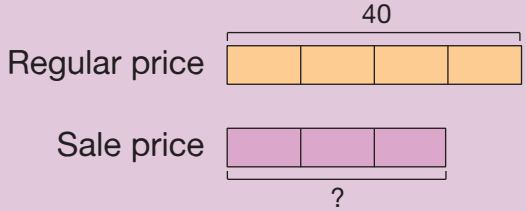
Two-Step Method



25% of 40 → $\frac{1}{4} \times 40 = \$10$

$40 - 10 =$ **\$30**

One-Step Method

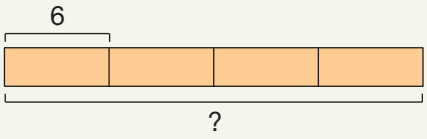


$100\% - 25\% = 75\%$

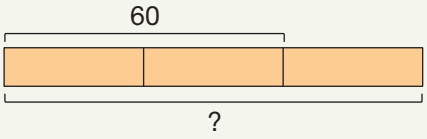
75% of 40 → $\frac{3}{4} \times 40 =$ **\$30**

Lesson Activities

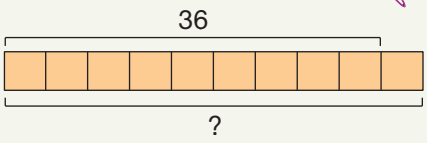
A



$\frac{1}{4}$ of _____ = 6



$\frac{2}{3}$ of _____ = 60

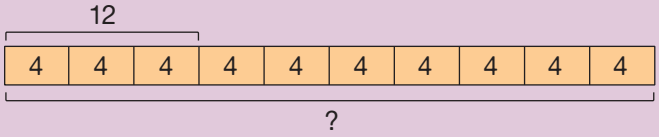


$\frac{9}{10}$ of _____ = 36

B

Use a Percentage to Find the Total Amount

Ex. Brynn scored 12 points at the basketball game. She scored 30% of her team's points. How many points did her team score in all?

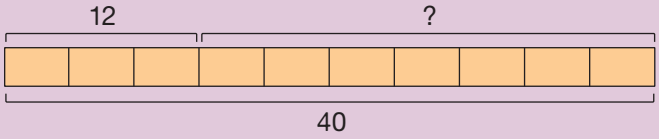


30% of what equals 12?

12 ÷ 3 = 4

4 × 10 = **40 points**

How many points did her teammates score?
What percentage of the total points did her teammates score?



40 – 12 = **28 points**

100% – 30% = **70%**

In a survey, 8 people said pancakes are their favorite breakfast food. These 8 people were 40% of all the people surveyed. How many people were surveyed?

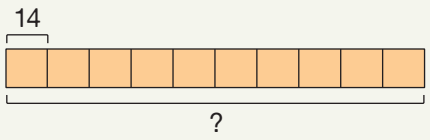
How many people did not choose pancakes? What percentage of people did not choose pancakes?

Brian has read 75% of his library book. He has read 150 pages so far. How many pages long is the book?

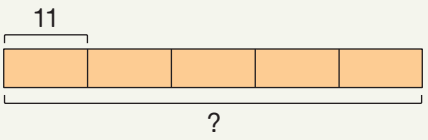
How many pages does he have left to read? What percentage of the book does he have left to read?

Practice

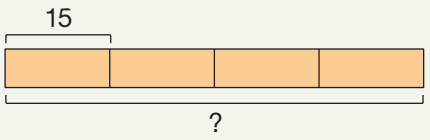
Use the bar models to complete.



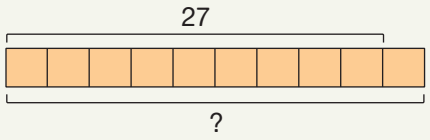
10% of _____ = 14



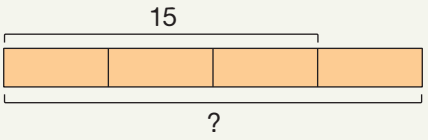
20% of _____ = 11



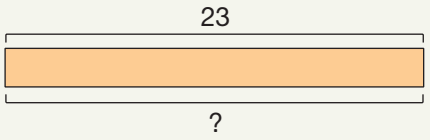
25% of _____ = 15



90% of _____ = 27



75% of _____ = 15



100% of _____ = 23

Use the bar models to complete. Split and label each bar to match the problem.

50% of _____ = 45

$33\frac{1}{3}$% of _____ = 40

10% of _____ = 60

60% of _____ = 90

30% of _____ = 15

$66\frac{2}{3}$% of _____ = 24

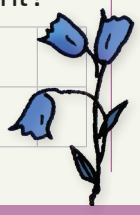
Use the bar models to complete. Split and label each bar to match the problem.

Steven helped his parents plant spring flowers. He planted 25% of the flowers, and his parents planted the rest. Steven planted 30 flowers. How many flowers did they plant in all?

How many flowers did his parents plant?

Evie spent 60% of her money on a movie ticket and the rest on snacks. The movie ticket cost $9. How much did she spend in all?

How much did she spend on snacks?

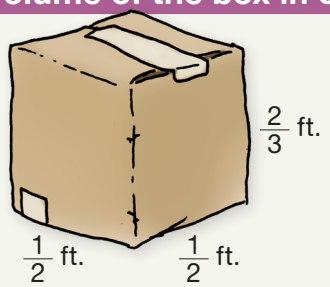


Review

Find the products.

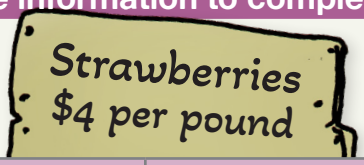
7.085 × 4	0.191 × 80	10.7 × 36

Find the volume of the box in cubic feet. Write your equations in the workspace.

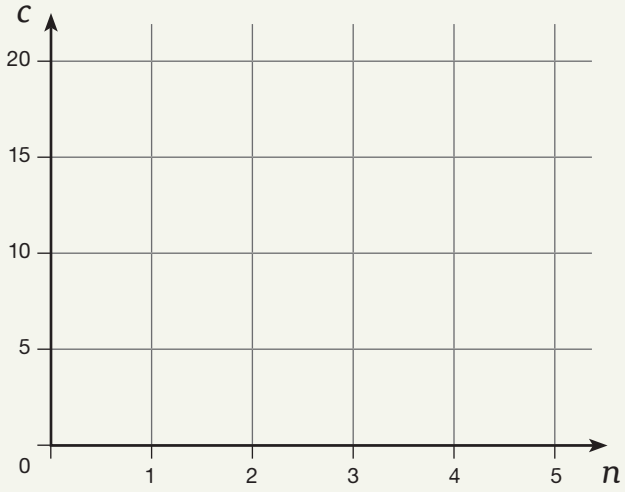


Volume: _____

Use the information to complete the chart, draw a graph, and answer the questions.



Pounds	Cost ($)
0	0
1	4
2	
3	
4	
5	



Write an equation that shows the relationship between the number of pounds of strawberries (n) and their total cost (c).

How much do $2\frac{1}{2}$ lb. of strawberries cost? Use the graph to approximate the answer.

How much do $4\frac{1}{2}$ lb. of strawberries cost? Use the graph to approximate the answer.

Lesson Activities

A

Goal: $400

Money Raised: $300

125%	$500
100%	$400
75%	$300
50%	$200
25%	$100

Money Raised: $400

125%	$500
100%	$400
75%	$300
50%	$200
25%	$100

Money Raised: $500

125%	$500
100%	$400
75%	$300
50%	$200
25%	$100

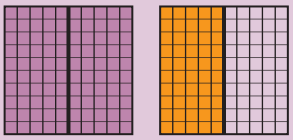
B

Percentages Greater Than 100%

We use percentages greater than 100% to stand for more than the original amount.

Ex. Write 150% as a mixed number.

$$150\% = \frac{150}{100} = \frac{3}{2} = \mathbf{1\frac{1}{2}}$$



Ex. What is 150% of 40?

Mental Math

100% of 40 = 40
50% of 40 = 20
40 + 20 = **60**

Fraction Multiplication

$1\frac{1}{2} \times 40$

$\frac{3}{2} \times 40 = \mathbf{60}$

C

Dice Tic-Tac-Toe (2-Player Game)

1	2	3	4	5
100% of 75	190% of 20	100% of 115	$166\frac{2}{3}\%$ of 120	150% of 200
$133\frac{1}{3}\%$ of 60	150% of 120	120% of 35	125% of 200	200% of 115
125% of 28	200% of 45	$133\frac{1}{3}\%$ of 300	100% of 48	$166\frac{2}{3}\%$ of 300
180% of 50	100% of 99	125% of 80	110% of 60	175% of 40
200% of 75	175% of 8	150% of 30	140% of 25	100% of 72

Practice

Write the mixed number or whole number equivalent to each percentage.

125% = $1\frac{1}{4}$	150% =	175% =	200% =
$133\frac{1}{3}$% =	$166\frac{2}{3}$% =	110% =	190% =
120% =	180% =	300% =	350% =

Complete.

100% of 50 = _____	100% of 80 = _____	100% of 60 = _____
120% of 50 = _____	110% of 80 = _____	150% of 60 = _____
140% of 50 = _____	120% of 80 = _____	200% of 60 = _____
160% of 50 = _____	130% of 80 = _____	250% of 60 = _____
180% of 50 = _____	140% of 80 = _____	300% of 60 = _____
200% of 50 = _____	150% of 80 = _____	350% of 60 = _____

Complete.

125% of 20 = _____	200% of 25 = _____	125% of 20 = _____
175% of 24 = _____	140% of 30 = _____	$166\frac{2}{3}$% of 12 = _____

Solve. Write the equations you use.

Seattle's average rainfall is approximately 40 in. per year. In 2021, the rainfall was 110% of the average amount. How many inches of rain fell on Seattle that year?

In 2012, Seattle's rainfall was 80% of the average amount. How many inches of rain fell on Seattle that year?

Review

Use long division to solve. Use the multiplication table to help.

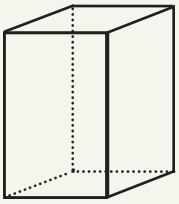
3 5 | 2 8 7

3 5 | 2 , 8 7 6

3 5 | 8 2 . 9 5

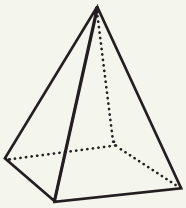
	× 20
1	20
2	40
3	60
4	80
5	100
6	120
7	140
8	160
9	180

Write the name of each 3-D solid and tell how many faces it has.



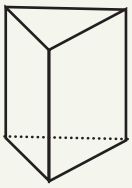
Name: _____

Number of faces: _____



Name: _____

Number of faces: _____



Name: _____

Number of faces: _____

Use bar models to complete the blanks and answer the questions.

Xander used blue and green beads to make bracelets. The ratio of blue beads to green beads was 2 to 5. He used 150 more green beads than blue beads.

Blue

Green

Number of blue beads: _____

Number of green beads: _____

Express the number of blue beads as a fraction of the number of green beads.

Express the number of green beads as a fraction of the number of blue beads.

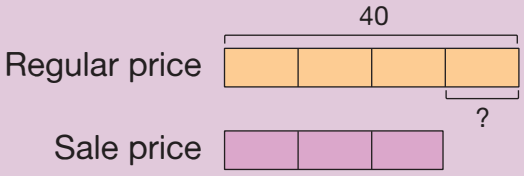
Lesson Activities

Percent Increase and Decrease Problems

A

Ex. The sweater's regular price is $40. Today, the sweater is on sale for 25% off the regular price. How much does it cost?

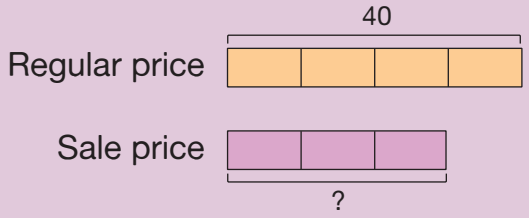
Two-Step Method



25% of 40 → $\frac{1}{4} \times 40 = \$10$

$40 - 10 = \mathbf{\$30}$

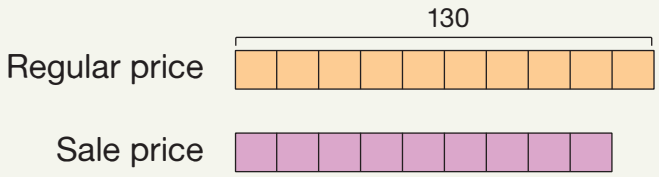
One-Step Method



$100\% - 25\% = 75\%$

75% of 40 → $\frac{3}{4} \times 40 = \mathbf{\$30}$

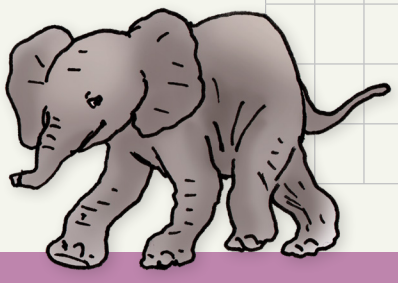
Last year, there were 130 children in the soccer league. This year, there are 10% fewer children in the league. How many children are in the league this year?



The baby elephant weighed 210 pounds when it was born. After one month, it weighed 50% more. How much did the elephant weigh after one month?

Birth weight

One-month weight



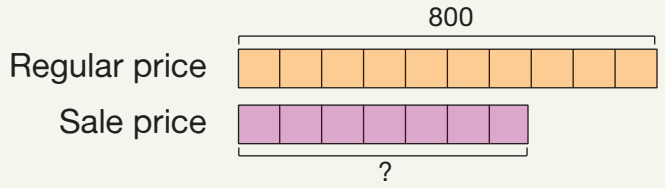
Practice

Use mental math to complete.

90	increase by 10%	99	600	increase by $33\frac{1}{3}$	
90	decrease by 10%		600	decrease by $33\frac{1}{3}$	
75	increase by 100%		200	increase by 30%	
75	decrease by 100%		200	decrease by 30%	

Use bar models to solve.

The rug normally costs $800. Today, it is on sale for 30% off the normal price. How much does the rug cost?



The bill for breakfast was $40. Maya's mom paid the bill and also left a 20% tip. How much did she pay in all?

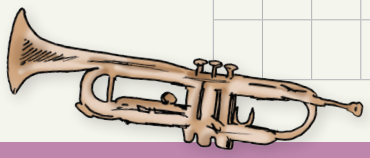
Original bill

Total amount paid

Last week, Lainey practiced the trumpet for 120 minutes. This week, she'd like to practice 30% more minutes than she practiced last week. How many minutes does she need to practice to meet her goal?

Last week

This week



Review

Evaluate. Write your answers in simplest form. If your answer is an improper fraction, convert the improper fraction to a mixed number.

$\frac{5}{8} + \frac{5}{2} - \frac{3}{4}$

$\frac{11}{12} - \frac{1}{6} - \frac{2}{3}$

$\frac{4}{5} + \frac{3}{4} + \frac{7}{10}$

Solve each equation. Show all your steps. Then, substitute the solution into the equation to check that it is correct.

$125 = s + 46$

Check:

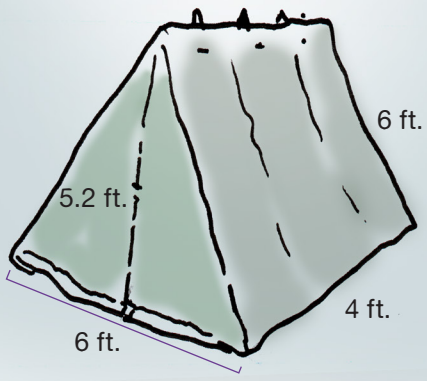
$n - 27 = 36$

Check:

Rani wants to make a play tent for her little sister. Use the directions to answer the questions. Write the equations you use.

Play Tent Directions:

1. Make two rectangular panels for the sides. Each panel should be 4 ft. by 6 ft.
2. Make two triangular panels for the front and back. Each triangle should have a base of 6 ft. and a height of 5.2 ft.



What is the total area of the four sides of the tent?

Fabric costs $6 per square foot. How much does it cost to buy enough fabric for the sides and back of the tent?

Unit Wrap-Up

Write the fraction that is equivalent to the percentage. Write the fractions in simplest form.

25% =	75% =	$33\frac{1}{3}\%$ =	$66\frac{2}{3}\%$ =
10% =	20% =	30% =	40% =
50% =	60% =	70% =	80% =

Convert the percentages to decimals.

37% = _____ 99% = _____

10% = _____ 6% = _____

Convert the fractions to percentages.

$\frac{49}{100}$ = $\frac{3}{100}$ =

$\frac{7}{20}$ = $\frac{8}{25}$ =

Use mental math to complete.

50% of 160 = _____	25% of 200 = _____	$33\frac{1}{3}$ % of 900 = _____
25% of 160 = _____	75% of 200 = _____	$66\frac{2}{3}$ % of 900 = _____
10% of 70 = _____	20% of 25 = _____	10% of 40 = _____
30% of 70 = _____	120% of 25 = _____	5% of 40 = _____

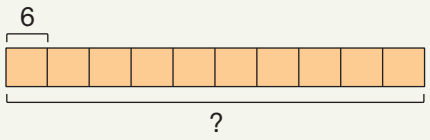
Use mental math or written equations to complete.

75% of 320

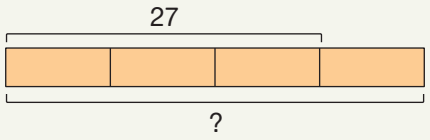
80% of 300

150% of 110

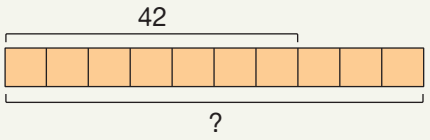
Use the bar models to complete.



10% of _____ = 6



75% of _____ = 27



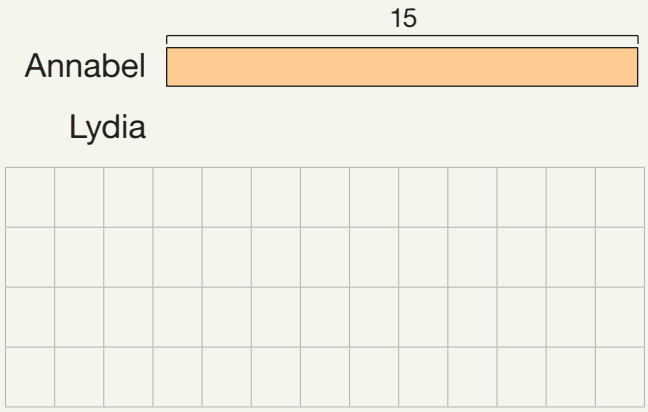
70% of _____ = 42

Unit Wrap-Up

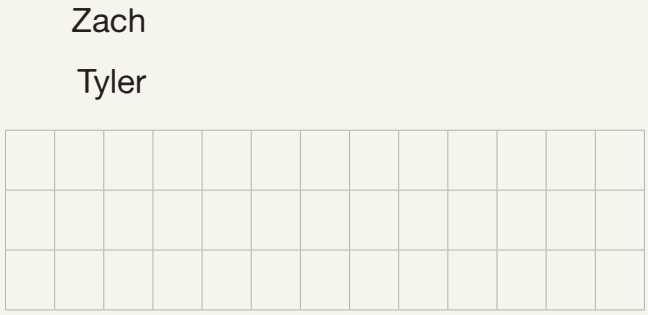
Use bar models to solve.

Annabel and Lydia both collect mugs. Annabel has 15 mugs. Lydia has 20% fewer mugs than Annabel. How many mugs does Lydia have?

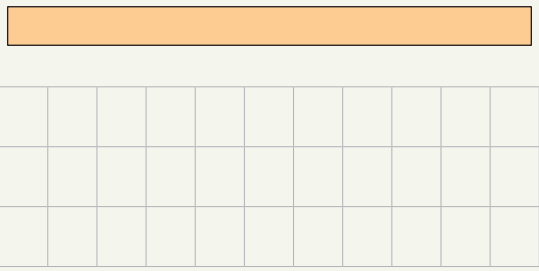
How many more mugs does Annabel have than Lydia?



Zach and Tyler are on the swim team. At the last practice, Zach swam 60 laps. He swam 75% as many laps as Tyler. How many laps did Tyler swim?



★ Last month, Nova spent 60% of her money and saved the rest. She saved $36. How much money did she spend?



Stella, Brayden, and Amir are on the track team. Last week, Stella ran 50 laps. Brayden ran 90% as many laps as Stella. How many laps did Brayden run?

Amir ran $33\frac{1}{3}$% more than Brayden. How many laps did Amir run?

Who ran the most laps?