Math Lesson Plan

Grade Level: 6th **Grade Subject: Mathematics**

All work can be completed on a separate piece of paper, in an electronic document (ex. Google Doc), or you may contact your school for a printed copy of this packet.

Complete for the week	Day	Standard	Activity/Assignment	Instructions	Additional Resources/Information
April 27-May 1, 200	21	Review	Multiplication Practice	Set a timer for 2-3 minutes to see how many facts you can do. Then, fill in the ones you did not have time to answer. Study them for a few minutes and then repeat the process two more times. Each time you repeat, try to increase your score!	The worksheets for this lesson were found on https://www.math-drills.com/. If you have access to the internet, you can print more for additional practice.
	22	6.NS.A.1	Divide Fractions	Read over Lesson 1.11 Dividing Fractions on pages 47-48. Choose 10 problems to complete on page 48. Show your work on a seperate sheet of paper.	Try the enrichment problems on the bottom of page 48 for extra practice.
	23	6.NS.B.3	Multiply and Divide Decimals	Read over Lesson 2.6 and 2.7 on pages 61-62. On the bottom of page 61, choose 5 problems to complete. On page 62, choose 5 problems to complete as well. Show your work on a seperate sheet of paper.	Try the enrichment problems on the bottom of page 62 for extra practice or choose a few subtraction problems on the top of page 61.
May 4- 8, 2020	24	6.SP.B.4	Data Displays	Read over Lesson 6.3 on pages 120-121. On page 122, answer #1-7.	
	25	6.EE.A.1	Order of Operations	Read over Lesson 7.3 on pages 135-137. On page 137, choose 10 problems to complete. Show your work on a seperate sheet of paper.	Check out the top of page 135 and try some problems from the Expressions Lesson 7.2.
	26	6.EE.B.5	Equations	Read over Lesson 8.3 and 8.4 on pages 155-158. On page 156, choose 6 problems to complete. On	

Math Lesson Plan

				page 159, choose 6 problems to complete.	
May 11-15, 2020	27	6.RP.A.2	Unit Rates	Read over Lesson 9.4 on page 195 then choose 10 problems to complete on page 195. Show your work on a seperate sheet of paper.	
	28	6.RP.A.3	Proportions	Read over Lesson 9.5 on page 197 then choose 10 problems to complete on the top of page 198. Show your work on a seperate sheet of paper.	
May 18-22, 2020 **This work is for extra credit.**	29	6.RP.A.3c	Fractions, Decimals, and Percents	Read over Lesson 10.1 on pages 220-222. On pages 222-223, complete either the even or odd numbered questions.	
	30	6.G.A.1	Area of Polygons	Read over Lesson 11.6 on pages 255-257. Choose 5 questions to complete on pages 257-258. Show your work on a separate sheet of paper.	

Day 21

Multiplication Facts to 144 (A)

Find each product.

5 × 8	12 × 11	12 × 4	1 × 6	7 × 5	7 × 7	5 × 11	11 × 0	0 × 7	0 × 8
11 × 8	4 × 9	11 × 1	2 × 1	11 × 12	10 × 12	7 × 8	0 × 3	6 × 11	9 × 3
5 × 6	12 × 3	6 × 12	9 × 3	4 × 8	10 × 7	12 × 1	0 × 5	12 × 12	6 × 5
5 × 4	4 × 7	9 × 6	6 × 2	8 × 9	1 × 4	4 × 11	4 × 0	5 × 9	1 × 9
7 × 11	6 × 8	1 × 7	0 × 6	10 × 10	1 × 1	2 × 8	1 × 0	2 × 10	2 × 4
4 × 12	4 × 4	12 × 5	11 × 11	2 × 9	3 × 10	1 × 3	0 × 2	7 × 12	2 × 11
0 × 12	3 × 4	10 × 1	2 × 7	1 × 5	7 × 3	4 × 6	3 × 11	3 × 5	8 × 10
7 × 5	11 × 9	8 × 8	9 × 10	3 × 6	10 × 6	6 × 5	9 × 9	7 × 9	0 × 10
2 × 3	5 × 10	6 × 7	4 × 5	11 × 10	10 × 4	6 × 6	8 × 1	10 × 2	9 × 12
8 × 12	3 × 3	3 × 8	10 × 6	5 × 5	2 × 5	2 × 12	0 × 9	2 × 10	2 × 2

Day 21

Multiplication Facts to 144 (B)

Find each product.

4 × 11	6 × 6	12 × 5	10 × 5	9 × 1	5 × 1	0 × 2	0 × 5	10 × 4	5 × 4
9 × 9	9 × 6	1 × 1	3 × 11	9 × 10	8 × 12	3 × 11	5 × 12	3 × 9	9 × 4
0 × 6	12 × 12	12 × 3	5 × 5	1 × 8	12 × 7	3 × 3	4 × 8	3 × 0	9 × 6
0 × 11	8 × 5	3 × 5	1 × 7	7 × 4	0 × 4	8 × 5	4 × 4	1 × 10	12 × 4
3 × 6	10 × 12	2 × 11	6 × 4	11 × 7	9 × 2	3 × 7	10 × 3	8 × 2	6 × 12
2 × 1	2 × 12	11 × 8	8 × 2	4 × 11	1 × 6	1 × 4	2 × 2	4 × 3	7 × 2
7 × 6	2 × 4	10 × 7	5 × 7	11 × 11	8 × 10	2 × 6	9 × 12	2 × 3	5 × 2
10 × 10	8 × 8	11 × 12	6 × 6	9 × 5	8 × 6	3 × 8	0 × 12	6 × 5	1 × 12
11 × 1	5 × 10	9 × 0	11 × 5	9 × 8	3 × 6	7 × 7	11 × 10	0 × 1	7 × 0
6 × 11	7 × 8	0 × 10	1 × 3	2 × 10	6 × 10	8 × 0	11 × 9	7 × 9	11 × 7

Day 21

Multiplication Facts to 144 (C)

Find each product.

6 × 4	6 × 8	7 × 1	2 × 1	7 × 10	12 × 7	5 × 4	1 × 3	8 × 0	5 × 8
8 × 7	11 × 10	1 × 1	9 × 1	9 × 11	2 × 3	12 × 10	5 × 5	11 × 11	5 × 7
8 × 1	4 × 4	3 × 8	12 × 1	1 × 5	0 × 1	4 × 12	11 × 0	8 × 4	9 × 7
6 × 5	0 × 5	11 × 3	3 × 9	4 × 10	8 × 11	5 × 9	4 × 1	9 × 5	10 × 0
6 × 12	12 × 11	7 × 7	10 × 9	5 × 3	7 × 4	2 × 2	6 × 10	2 × 6	12 × 3
2 × 5	7 × 11	5 × 12	0 × 6	12 × 12	10 × 1	7 × 2	0 × 12	8 × 8	9 × 8
10 × 3	2 × 8	4 × 7	2 × 10	10 × 10	2 × 4	10 × 3	7 × 5	3 × 7	11 × 7
9 × 0	3 × 8	3 × 0	9 × 9	3 × 10	2 × 11	1 × 6	6 × 6	4 × 3	11 × 5
4 × 0	6 × 3	4 × 11	5 × 10	6 × 7	11 × 6	2 × 12	7 × 0	9 × 6	3 × 3
2 × 9	12 × 9	4 × 9	2 × 0	12 × 8	1 × 11	8 × 7	10 × 8	11 × 10	11 × 8

Day 22

words,

1.11 Dividing Fractions

One way to remember how to divide with fractions is using the phrase "keep it, change it, flip it." Keep the first fraction the same, change the division sign to a multiplication sign, and flip the second fraction (change it to its reciprocal).

Example 1: Divide $\frac{3}{5}$ by $\frac{1}{3}$.

Step 1: Rewrite as an expression of 2 fractions.

$\frac{3}{5} \div \frac{1}{3}$

Step 2: Keep the first fraction as is, change the division sign to a multiplication sign, and flip the second fraction (reciprocal).

$\frac{3}{5} \times \frac{3}{1}$

Step 3: Simplify if possible and multiply.

$\frac{3}{5} \times \frac{3}{1} = \frac{9}{5}$

Step 4: Rewrite the improper fraction as a mixed number.

$\frac{9}{5} = 1\frac{4}{5}$

Example 2: Divide 5 by $\frac{4}{7}$.

Step 1: Rewrite as an expression of 2 fractions.

$\frac{5}{1} \div \frac{4}{7}$

Step 2: Keep the first fraction as is, change the division sign to a multiplication sign, and flip the second fraction (reciprocal).

$\frac{5}{1} \times \frac{7}{4}$

Step 3: Simplify if possible and multiply.

$\frac{5}{1} \times \frac{7}{4} = \frac{35}{4}$

Step 4: Rewrite the improper fraction as a mixed number.

$\frac{35}{4} = 8\frac{3}{4}$

Example 3: Divide $3\frac{3}{4}$ by $2\frac{1}{3}$.

Step 1: Rewrite each mixed number as an improper fraction.

$3\frac{3}{4} = \frac{(4 \cdot 3)+3}{4} = \frac{12+3}{4} = \frac{15}{4}$ and $2\frac{1}{3} = \frac{(3 \cdot 2)+1}{3} = \frac{6+1}{3} = \frac{7}{3}$

Step 2: Rewrite as an expression of 2 fractions.

$\frac{15}{4} \div \frac{7}{3}$

Day 22

Step 3: Keep the first fraction as is, change the division sign to a multiplication sign, and flip the second fraction (reciprocal).

$$\frac{15}{4}\times\frac{3}{7}$$

Step 4: Simplify if possible and multiply.

$$\frac{15}{4}\times\frac{3}{7}=\frac{45}{28}$$

Step 5: Rewrite the improper fraction as a mixed number.

$$\frac{45}{28}=1\frac{17}{28}$$

Activity

Divide and simplify answers to lowest terms. (DOK 3)

1. $\frac{1}{3}\div\frac{1}{2}=$ ______
2. $\frac{1}{4}\div\frac{1}{2}=$ ______
3. $\frac{1}{3}\div 2=$ ______
4. $\frac{1}{2}\div\frac{1}{2}=$ ______
5. $\frac{5}{6}\div\frac{3}{4}=$ ______
6. $18\frac{3}{5}\div 2\frac{1}{5}=$ ______
7. $70\frac{1}{4}\div 6\frac{1}{2}=$ ______
8. $3\frac{3}{7}\div 1\frac{1}{2}=$ ______
9. $5\frac{1}{4}\div 3\frac{1}{2}=$ ______
10. $7\div 4\frac{1}{2}=$ ______
11. $16\frac{1}{3}\div 4=$ ______
12. $8\frac{2}{5}\div 1\frac{1}{2}=$ ______

1.12 Factors Enrichment

List the factors of each number. Circle the common factors of each pair. (DOK 1)

1. 16: ______
   20: ______
2. 45: ______
   25: ______
3. 9: ______
   20: ______
4. 18: ______
   30: ______
5. 36: ______
   54: ______
6. 18: ______
   21: ______

Solve each word problem involving fractions. (DOK 2, 3)

7. Gabby has 130 insects in her bug collection that have wings and 70 that have pincers. She wants to buy display cases for her collection but is unsure of how many she will need. Each display case should have an equal number of insects with wings and pincers.
   A. If she wants each case to have the greatest number of insects, how many display cases does she need to buy?

      Gabby should buy_____ display cases.
   B. How many insects with wings will be in each container?_____
   C. How many insects with pincers will be in each container?_____

Day 23

Activity

Subtract the multi-digit decimals below. (DOK 1)

1. 5.25 – 4.7 = _____	8. 40.09 – 9.99 = _____	15. 30.00 – 22.95 = _____
2. 23.657 – 9.83 = _____	9. 115.45 – 4.79 = _____	16. 15.789 – 6.32 = _____
3. 56.54 – 17.92 = _____	10. 45.18 – 23.65 = _____	17. 478.63 – 99.2 = _____
4. 294.78 – 80.99 = _____	11. 12.96 – 7.32 = _____	18. 15.45 – 8.58 = _____
5. 70.00 – 68.99 = _____	12. 19.2 – 8.63 = _____	19. 102.5 – 1.079 = _____
6. 58.6 – 9.153 = _____	13. 8.123 – 5.096 = _____	20. 7.054 – 3.009 = _____
7. 405.97 – 7.325 = _____	14. 14.32 – 0.58 = _____	21. 12.42 – 3.235 = _____

* 2.6 Multiplying Decimals

Follow the steps in the example to see how to multiply multi-digit decimals.

Example 1: Multiply 56.2 and 0.17.

Step 1: Write the numbers vertically.

```
  56.2
× 0.17
```

Step 2: Multiply.

```
   41
  56.2
× 0.17
  3934
+ 562
  9554
```

Step 3: Since there are 3 total numbers to the right of the decimal, place the decimal point so that there are 3 numbers to the right of the decimal in the answer.

Answer: 9.554

Activity

Multiply the multi-digit decimals below. (DOK 2)

1. 15.2 × 3.5 = _____	6. 4.5 × 7.1 = _____	11. 0.47 × 6.1 = _____
2. 9.54 × 5.3 = _____	7. 0.052 × 0.33 = _____	12. 1.3 × 1.57 = _____
3. 5.72 × 6.3 = _____	8. 4.12 × 6.8 = _____	13. 16.4 × 0.5 = _____
4. 4.8 × 3.2 = _____	9. 23.65 × 9.2 = _____	14. 0.87 × 3.21 = _____
5. 45.8 × 2.2 = _____	10. 1.54 × 0.43 = _____	15. 5.94 × 0.65 = _____

Day 23

2.7 Dividing Decimals

Follow the steps in the example to see how to divide multi-digit decimals.

Example 1: Divide 374.5 by 0.07.

Step 1: Rewrite the problem.
$0.07\overline{)374.5}$

Step 2: You cannot divide by a decimal number. We must move the decimal point to the right as many places as it takes to make the number whole. Since we must move the decimal two places to the right for the outside number, we must also move the decimal two places to the right for the inside number. Once you have moved the decimal for the inside number, insert 0s as place holders.

$0.07\overline{)374.5}$ $\quad$ $0.\underline{07}\overline{)374.\underline{50}0}$ $\quad$ $7.0\overline{)37450.0}$

Step 3: Divide.

```
   5350
7)37450
 -35
   24
  -21
    35
   -35
     0
```

Activity

Divide the multi-digit decimals below. (DOK 2)

1. 0.676 ÷ 0.013 = _____
2. 70.32 ÷ 0.08 = _____
3. 54.60 ÷ 0.84 = _____
4. 10.35 ÷ 0.45 = _____
5. 18.46 ÷ 1.3 = _____
6. 14.6 ÷ 0.002 = _____
7. 125.25 ÷ 0.75 = _____
8. 33.00 ÷ 1.65 = _____
9. 154.08 ÷ 1.8 = _____
10. 0.4374 ÷ 0.003 = _____
11. 292.9 ÷ 0.29 = _____
12. 6.375 ÷ 0.3 = _____
13. 4.8 ÷ 0.08 = _____
14. 1.2 ÷ 0.024 = _____
15. 15.725 ÷ 3.7 = _____

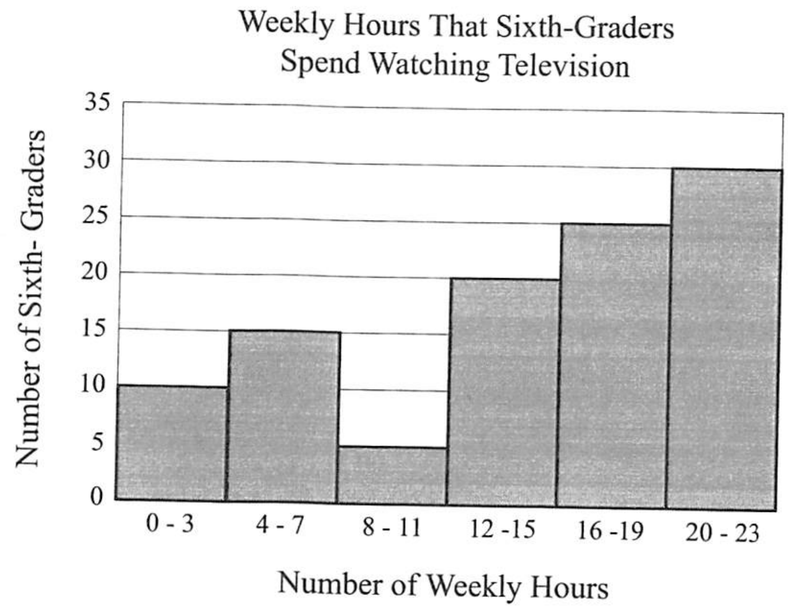
2.8 Decimals Enrichment

Answer the following questions. (DOK 1)

1. Elena bought 7 pieces of artwork for a total of $875. If each piece was priced the same, how much did 1 piece of art cost? $_____
2. Patrick has 432 marbles in his collection. If he divides his marbles into 9 groups, how many marbles are in each group? _____ marbles
3. Missy has $750 in bills. If all the bills are worth $5, how many bills does Missy have? _____ bills

Day 24

The histogram below describes the weekly hours that sixth-graders spend watching television. Use the histogram to answer questions 3–7. (DOK 2)



3. How many sixth-graders watch between 12 and 19 hours of television per week?_____

4. How many sixth-graders watch 17 hours of television per week? Circle the correct answer.
   5 10 15 20 25 30 Cannot be determined

5. How many sixth-graders participated in this survey? _____

6. Which interval has the smallest frequency? Circle the correct answer.
   0–3 4–7 8–11 12–15 16–19 20–23 Cannot be determined

7. Which interval has the largest frequency? Circle the correct answer.
   0–3 4–7 8–11 12–15 16–19 20–23 Cannot be determined

* 6.3 Box and Whisker Plots *

A **box and whisker plot** is another way to display a data set. The box and whisker plot is defined by the minimum, Q1, median, Q3, and maximum. The **minimum** is the smallest entry in the data set, and the **maximum** is the largest entry in the data set. Recall that the **median**, or **Q2**, is the middle number. That is, the median divides the data set in half. The median of the lower half is the **Q1**, and the median of the upper half is the **Q3**.

Example 1: The following data set describes the ages of the employees at Larry's Lumber Company. Construct a box and whisker plot.

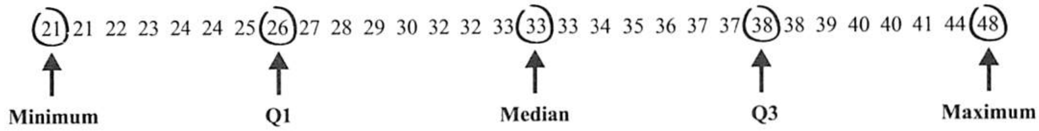
21 21 22 23 24 24 25 26 27 28
37 37 38 38 39 40 40 41 44 48
29 30 32 32 33 33 33 34 35 36

Day 24

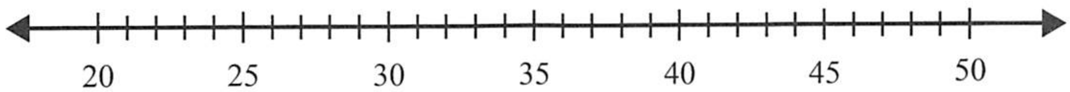
Step 1: List the data from least to greatest.

21 21 22 23 24 24 25 26 27 28
29 30 32 32 33 33 33 34 35 36
37 37 38 38 39 40 40 41 44 48

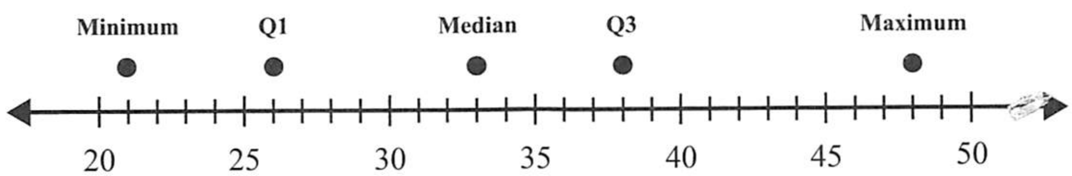
Step 2: Find the minimum, Q1, median, Q3, and maximum.



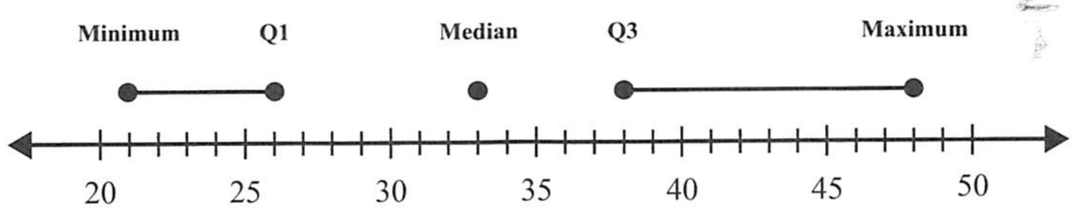
Step 3: Draw a number line. Since the minimum is 21 and the maximum is 48, label the number line from 20 to 50.



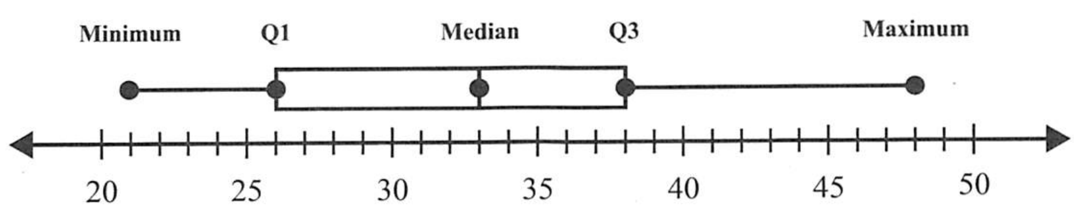
Step 4: Plot the minimum, Q1, median, Q3, and maximum slightly above the number line.



Step 5: Draw a horizontal line segment that connects the minimum and Q1; draw a horizontal line segment that connects Q3 and the maximum.



Step 6: Draw two horizontal line segments that connect Q1 and Q3.

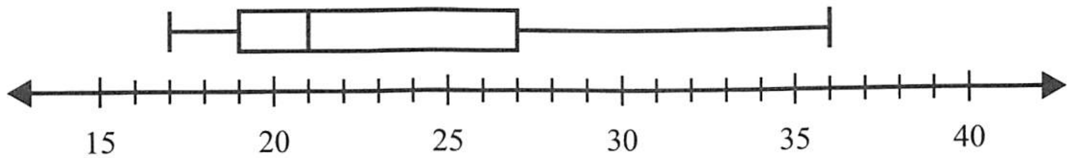


The spread from the minimum to Q1 and from Q3 to the maximum together are considered the whiskers. The spread from Q1 to Q3 is considered the box. The box also contains the median. Recall, the difference between Q3 and Q1 is the IQR.

Day 24

Activity

Use the box and whisker plot to answer the following questions. (DOK 2)



1. What is the median of the data set? _____
2. What is the maximum of the data set? ____
3. What is the minimum of the data set? ____
4. What is the Q3 of the data set? _____
5. What is the Q1 of the data set? _____
6. What is the IQR of the data set? _____
7. What is the range of the data set? _____

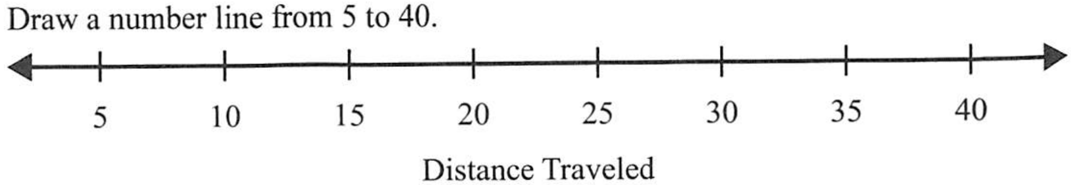
6.4 Dot Plots

A **dot plot**, sometimes called a line plot, is another way of displaying a data set. It uses the frequencies of each entry of a data set to describe a certain category.

Example 1: The frequency table below displays the number of weekly miles that an individual travels one way to work. Use the frequency table to construct a dot plot.

Distance in Miles	Frequency
5	7
10	5
15	3
20	2
25	3
30	1
35	4
40	6

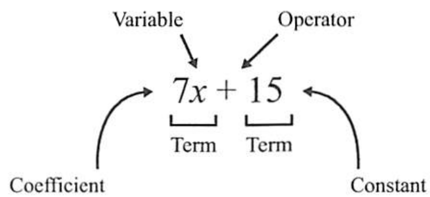
Step 1: Draw a number line from 5 to 40.



Day 25

7.2 Expressions

An expression is a number sentence that contains the addition, subtraction, multiplication, or division of terms. Terms are the parts of an expression that lie between the operators (+, –, ×, and ÷). Terms can be constants or have variables. A constant number is any real number. A variable is any value represented by a letter. If a constant is multiplied by a variable, the constant is referred to as a coefficient.



Activity

Use the word bank below to identify definitions and parts of an expression. Words can be used more than once. (DOK 1, 2)

Word Bank:

coefficient   constant   expression   variable   terms

1. $7x - 2 + 5y$ is an example of what? ______________
2. A letter used to describe an unknown value is called what? ______________
3. Operators separate what in an equation? ______________
4. In the expression $6x$, 6 is the ______________.
5. In the expression $10x + 5$, 5 is the ______________.
6. In the expression $5x - 1$, x is the ______________.
7. The expression $17x + 4 \div 2$ has three ______________.

7.3 Order of Operations

There is an order to how expressions must be simplified. If the order of this process is not followed, you can get different answers. One way of remembering the order of operations is the acronym, PEMDAS. Given an expression with multiplication, division, addition, subtraction, parentheses, or exponents, simplify in the following order:

1. **P**arentheses - first, check to see if anything inside the parentheses can be simplified or if anything must be distributed to the inside of the parentheses.
2. **E**xponents - second, simplify any portion of the expression that contains exponents.
3. **M**ultiplication - the third step depends on what comes first. Reading the expression from left to right, simplify multiplication in the order presented within the problem.
4. **D**ivision - the fourth step depends on what comes first. Reading the expression from left to right, simplify division in the order presented within the problem.

Day 25

5. **A**ddition - the fifth step depends on what comes first. Reading the expression from left to right, simplify addition in the order presented within the problem.

6. **S**ubtraction - the sixth step depends on what comes first. Reading the expression from left to right, simplify subtraction in the order presented within the problem.

Another way of remembering the order of operations is the expression, "**Please Excuse My Dear Aunt Sally**."

Example 1: Simplify the expression $5(2+3)-6$ using the order of operations.

Step 1: Simplify inside the parentheses.
$5(2+3)-6$
$5(5)-6$

Step 2: Multiply.
$5(5)-6$
$25-6$

Step 3: Subtract.
$25-6$
21

Example 2: Simplify the expression $24 \div 3 \times (5-3) + 2^2 - 5$ using the order of operations.

Step 1: Simplify inside the parentheses.
$24 \div 3 \times (5-3) + 2^2 - 5$
$24 \div 3(2) + 2^2 - 5$

Step 2: Simplify exponents.
$24 \div 3 \times (2) + 2^2 - 5$
$24 \div 3 \times (2) + 4 - 5$

Step 3: Multiply and divide in the order it appears from left to right.
$24 \div 3 \times (2) + 4 - 5$
$(24 \div 3) \times (2) + 4 - 5$
$(8) \times (2) + 4 - 5$
$(8 \times 2) + 4 - 5$
$(16) + 4 - 5$

Step 4: Add and subtract in the order it appears from left to right.
$16 + 4 - 5$
$20 - 5$
15

Example 3: Simplify the expression $\frac{3(7-5)-2}{4^2-2(4)}$ using the order of operations.

Step 1: Simplify inside the parentheses.
$$\frac{3(7-5)-2}{4^2-2(4)}$$
$$\frac{3(2)-2}{4^2-2(4)}$$

Step 2: Simplify exponents.
$$\frac{3(2)-2}{4^2-2(4)}$$
$$\frac{3(2)-2}{16-2(4)}$$

Day 25

Step 3: Multiply in the numerator, and then multiply in the denominator.

$$\frac{3(2)-2}{16-2(4)}$$

$$\frac{6-2}{16-8}$$

Step 4: Subtract in the numerator, and then subtract in the denominator.

$$\frac{6-2}{16-8}$$

$$\frac{4}{8}$$

Step 5: Simplify the fraction to lowest terms.

$$\frac{4}{8}=\frac{1}{2}$$

Activity

Evaluate and simplify using the Order of Operations. Write fraction answers as mixed numbers when necessary. (DOK 2)

1. $-10+7\times4-16=$ ____
2. $12(6+4)-2=$ ____
3. $15(10-3)-6\div2=$ ____
4. $22\div11-1\times13=$ ____
5. $\dfrac{6-2^2+7}{5^3-(9^2+17)}=$ ____
6. $6^0-1+10\div2=$ ____
7. $(30\div3)\times2-7=$ ____
8. $\dfrac{4(4-10)-1}{8^2-3\times23}=$ ____
9. $3^2+(7+1)-5=$ ____
10. $\dfrac{7^2-5^2+2}{9+(2^3-1)}=$ ____
11. $9^2+2-8\times4=$ ____
12. $\dfrac{8\times(2+1)}{6^2-4\times8}=$ ____
13. $2^2+(4-1)\times4=$ ____
14. $\dfrac{(10-2)\times8}{3^3+2^3-1}=$ ____
15. $4-(3-6)+2=$ ____
16. $\dfrac{6^2-2\times11}{7-2^3}=$ ____
17. $4^2(3+4)-70=$ ____
18. $\dfrac{7^2+3}{2^3+6\times8}=$ ____
19. $2\times4-3\times5=$ ____
20. $\dfrac{(4+2)\times7}{3^2+(4^2+1)}=$ ____
21. $3(3+5)-1=$ ____
22. $12+4^2\times3-9=$ ____
23. $\dfrac{7-1^5+4}{4^2-(1+3)}=$ ____
24. $6+5\times4-3=$ ____

Day 26

4. Given $50 \div 2 = 25$, is the equation $(50 \div 2) + 6 = 25 \times 6$ balanced? ______
   Property of equality: ____________________

   Mark the reason for whether or not the equation is balanced.

   □ The left side was multiplied by 6, and 6 was added to the right side.

   □ Six was added to the left side, and the right side was divided by 6.

   □ Six was added to the left side, and the right side was multiplied by 6.

   □ Six was added to both sides.

5. Given $19 + 11 = 30$, is the equation $(19 + 11) + 9 = 30 + 9$ balanced? ______
   Property of equality: __________________

   Mark the reason for whether or not the equation is balanced.

   □ Each side was multiplied by 9.

   □ Each side was divided by 9.

   □ Nine was subtracted from each side.

   □ Nine was added to each side.

Write the operation that will isolate the variable. (DOK 2)

6. $y + 15 = 33$ ______________

8. $r - 27 = 41$ ______________

10. $y \div 8 = 2$ ______________

7. $17q = 54$ ______________

9. $t \times 9 = 36$ ______________

8.3 One-Step Equations with Addition and Subtraction

To solve one-step equations, use inverse operations to isolate the variable in an equation. What you do to one side of the equation must be done to the other side in order to keep a balanced equation. Recall that the opposite of addition is subtraction, and the opposite of subtraction is addition.

Example 1: Given the equation $x + 78 = 114$, solve for x.

Step 1: Since the given operation is addition, use subtraction to isolate the variable. That is, subtract 78 from each side.
$x + 78 = 114$
$x + 78 - \mathbf{78} = 114 - \mathbf{78}$

Step 2: Simplify each side of the equation.
$x + 78 - \mathbf{78} = 114 - \mathbf{78}$
$x = 36$

Day 26

Step 3: Check your answer by substituting 36 for x in the original equation.
$x + 78 = 114$
$36 + 78 = 114$
$114 = 114$

Since the result is a true statement, 36 is the solution to the equation.

Example 2: Given the equation $k - 34 = 100$, solve for k.

Step 1: Since the given operation is subtraction, use addition to isolate the variable. That is, add 34 to each side.
$k - 34 = 100$
$k - 34 + \mathbf{34} = 100 + \mathbf{34}$

Step 2: Simplify each side of the equation.
$k - 34 + \mathbf{34} = 100 + \mathbf{34}$
$k = 134$

Step 3: Check your answer by substituting 134 for k in the original equation.
$k - 34 = 100$
$134 - 34 = 100$
$100 = 100$

Since the result is a true statement, 134 is the solution to the equation.

* Activity * Choose 6 problems.

Find the solution to the equation. (DOK 2)

1. $p + 5 = 11$ $p =$ ____
2. $k - 29 = 54$ $k =$ ____
3. $46 + m = 100$ $m =$ ____
4. $z + 19 = 32$ $z =$ ____
5. $f + 5 = 16$ $f =$ ____
6. $q - 17 = 25$ $q =$ ____
7. $16 + r = 25$ $r =$ ____
8. $w - 11 = 39$ $w =$ ____
9. $a - 36 = 100$ $a =$ ____
10. $23 + p = 36$ $p =$ ____
11. $b - 9 = 10$ $b =$ ____
12. $t - 12 = 36$ $t =$ ____
13. $z - 7 = 47$ $z =$ ____
14. $7 + z = 47$ $z =$ ____
15. $n + 13 = 52$ $n =$ ____
16. $s - 11 = 28$ $s =$ ____
17. $m + 28 = 28$ $m =$ ____
18. $y - 2 = 67$ $y =$ ____
19. $y + 19 = 41$ $y =$ ____
20. $x - 62 = 84$ $x =$ ____

Day 26

8.4 One-Step Equations with Multiplication and Division

To solve one-step equations, use inverse operations to isolate the variable in an equation. What you do to one side of the equation must be done to the other side in order to keep a balanced equation. Recall that the opposite of multiplication is division, and the opposite of division is multiplication.

Example 1: Given the equation $\frac{k}{8} = 10$, solve for k.

Step 1: Since the given operation is division, use multiplication to isolate the variable. That is, multiply each side by 8.

$\frac{k}{8} = 10$

$\frac{k}{8} \times \mathbf{8} = 10 \times \mathbf{8}$

Step 2: Simplify each side of the equation. Because multiplication and division are inverses, the 8s on the left side of the equation cancel.

$\frac{k}{8} \times \mathbf{8} = 10 \times \mathbf{8}$

$k = 80$

Step 3: Check your answer by substituting 80 for k in the original equation.

$\frac{k}{8} = 10$ $\frac{80}{8} = 10$ $10 = 10$

Since the result is a true statement, 80 is the solution to the equation.

Example 2: Given the equation $3x = 24$, solve for x.

Step 1: Since the given operation is multiplication, use division to isolate the variable. That is, divide each side by 3.

$3x = 24$

$3x \div \mathbf{3} = 24 \div \mathbf{3}$

Step 2: Simplify each side of the equation.

$3x \div \mathbf{3} = 24 \div \mathbf{3}$

$x = 8$

Step 3: Check your answer by substituting 8 for x in the original equation.

$3x = 24$

$3(8) = 24$

$24 = 24$

Answer: Since the result is a true statement, 8 is the solution to the equation.

 Day 26

Example 3: Given the equation $\frac{3}{4}q = 6$, solve for q.

Step 1: Since the given operation is multiplication, use division to isolate the variable. That is, multiply each side by the reciprocal of $\frac{3}{4}$. Recall that the reciprocal of $\frac{3}{4}$ is $\frac{4}{3}$.

$$\frac{3}{4}q = 6$$

$$\frac{3}{4}q \times \frac{4}{3} = 6 \times \frac{4}{3}$$

Step 2: Simplify each side of the equation. Multiplying a fraction by its reciprocal equals 1, so the left side reduces to q.

$$\frac{3}{4}q \times \frac{4}{3} = 6 \times \frac{4}{3}$$

$$q = \frac{6 \times 4}{3}$$

$$q = \frac{24}{3}$$

$$q = 8$$

Step 3: Check your answer by substituting 8 for q in the original equation.

$$\frac{3}{4}q = 6$$

$$\frac{3}{4}(8) = 6$$

$$\frac{3 \times 8}{4} = 6$$

$$\frac{24}{4} = 6$$

$$6 = 6$$

Answer: Since the result is a true statement, 8 is the solution to the equation.

Day 26

* Activity * Choose 6 problems.

Find the solution to the equation. (DOK 2)

1. $9m = 81$
   $m =$ ____

2. $3k = 27$
   $k =$ ____

3. $\frac{y}{2} = 166$
   $y =$ ____

4. $6t = 120$
   $t =$ ____

5. $7m = 112$
   $m =$ ____

6. $\frac{1}{5}x = 11$
   $x =$ ____

7. $\frac{q}{15} = 4$
   $q =$ ____

8. $13m = 52$
   $m =$ ____

9. $8a = 32$
   $a =$ ____

10. $27b = 81$
    $b =$ ____

11. $15x = 615$
    $x =$ ____

12. $6x = 48$
    $x =$ ____

13. $\frac{1}{60}h = 2$
    $h =$ ____

14. $\frac{b}{2} = 167$
    $b =$ ____

15. $\frac{z}{15} = 3$
    $z =$ ____

16. $3n = 36$
    $n =$ ____

17. $4k = 64$
    $k =$ ____

18. $48x = 96$
    $x =$ ____

19. $\frac{1}{4}w = 20$
    $w =$ ____

20. $\frac{x}{3} = 15$
    $x =$ ____

8.5 Independent and Dependent Variables

Independent variables function alone and are unaffected by any other variable. Generally, the x-values, or input values, are thought of as independent. **Dependent variables** rely on or respond to the independent variables. Generally, the y-values, or output values, are thought of as the dependent.

Example 1: Determine the independent and dependent variables in the following statement: The older Christy gets, the taller she gets.

Step 1: Identify the variables.

Christy's age
Christy's height

Step 2: Ask yourself, "Which event must happen for the other event to occur?" Christy must get older in order to get taller, so height depends on age.

Answer: Since height depends on age, height is the dependent variable. Therefore, age is the independent variable.

Day 27

9.4 Unit Rates

The ratio between two quantities can be called the **rate of change**. The **unit rate** is the rate that compares the change in one quantity to a 1-unit change in the other quantity. The denominator of a unit rate is always 1. When writing the rate of change and unit rate for a real world problem, it is important to include the units of measure. The average rate of speed is a unit rate comparing distance to 1 unit of time.

Example 1: Laurie traveled 312 miles in 6 hours. What is the **average rate of speed** in miles per hour (mph)?

Step 1: Write the ratio of the number of miles to the number of hours.

312 miles : 6 hours or $\frac{312 \text{ miles}}{6 \text{ hours}}$

Step 2: Simplify the ratio.

$$\frac{312 \text{ miles}}{6 \text{ hours}} = \frac{52 \text{ miles}}{1 \text{ hour}}$$

Laurie's average rate of speed is the same as the unit rate of speed. The average rate of speed is 52 miles per hour (or 52 mph).

Activity

Find the unit rate in each problem below. (DOK 2)

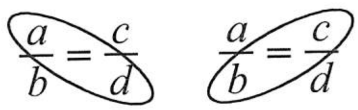
1. A race car went 500 miles in 4 hours. What was its average rate of speed?
2. Carrie drove 124 miles in 2 hours. What was her average speed?
3. After 7 hours of driving, Chad had traveled 364 miles. What was his average speed?
4. Anna drove 360 miles in 8 hours. What was her average speed?
5. After 3 hours of driving, Paul had traveled 183 miles. What was his average speed?
6. Nicole ran 25 miles in 5 hours. What was her average speed?
7. A train traveled 492 miles in 6 hours. What was its average rate of speed?
8. A commercial jet traveled 1,572 miles in 3 hours. What was its average speed?
9. Jillian drove 195 miles in 3 hours. What was her average speed?
10. Greg drove 336 miles away from his home in 8 hours. What was his average speed?
11. Caleb drove 128 miles in two hours. What was his average speed in miles per hour?
12. After 9 hours of driving, Kate had traveled 405 miles. What speed had she averaged?
13. Tewanda read a 2,000-word news article in 8 minutes. How many words did she read per minute?

Day 28

9.5 Proportions

Two ratios (fractions) that are equivalent to each other are called **proportions**. Consider $\frac{1}{4}=\frac{2}{8}$.

Notice that $(4)(2)=(1)(8)$. In general, if two ratios are proportional, the **cross products** are equal.



$$ad = bc$$

You can solve for the missing part of an equivalent ratio using cross products.

Example 1: Solve for x.

$$\frac{5}{15}=\frac{8}{x}$$

Step 1: Find the cross products and set them equal to each other. Multiply the two numbers that are diagonal to each other.

$5 \times x = 5x$

$15 \times 8 = 120$

Therefore, $5x = 120$.

Step 2: Undo the multiplication by dividing by 5 on both sides of the equal sign.

$$\frac{5}{5}x=\frac{120}{5}$$

Answer: $x = 24$

Example 2: Solve for x.

$$\frac{x}{12}=\frac{3}{4}$$

Step 1: Find the cross products and set them equal to each other. Multiply the two numbers that are diagonal to each other.

$x \times 4 = 4x$

$12 \times 3 = 36$

Therefore, $4x = 36$

Step 2: Undo the multiplication by dividing by 4 on both sides of the equal sign.

$$\frac{4}{4}x=\frac{36}{4}$$

Answer: $x = 9$

Day 28

Activity

Practice finding the number missing from the following proportions. First, multiply the two numbers that are diagonal from each other. Then, solve for x by dividing by the other number. (DOK 1)

1. $\frac{2}{4} = \frac{9}{x}$
2. $\frac{9}{3} = \frac{x}{7}$
3. $\frac{x}{12} = \frac{3}{6}$
4. $\frac{2}{x} = \frac{4}{12}$
5. $\frac{15}{x} = \frac{5}{3}$
6. $\frac{8}{x} = \frac{2}{5}$
7. $\frac{14}{6} = \frac{x}{3}$
8. $\frac{1}{x} = \frac{8}{64}$
9. $\frac{8}{2} = \frac{x}{3}$
10. $\frac{16}{2} = \frac{x}{4}$
11. $\frac{5}{6} = \frac{35}{x}$
12. $\frac{2}{x} = \frac{3}{18}$
13. $\frac{x}{4} = \frac{4}{16}$
14. $\frac{2}{5} = \frac{x}{40}$
15. $\frac{8}{4} = \frac{16}{x}$
16. $\frac{x}{2} = \frac{7}{14}$
17. $\frac{6}{12} = \frac{x}{8}$
18. $\frac{x}{40} = \frac{5}{20}$
19. $\frac{4}{8} = \frac{x}{4}$
20. $\frac{1}{4} = \frac{42}{x}$

21. The ratio of boys to girls in math class is 2 to 3. If there are 15 girls in math class, how many boys are in class? Write the proportion used to solve this problem, and find the answer. (DOK 1)

9.6 Proportional Relationships

A **proportional relationship** is a relationship in which one quantity varies directly with another. You can determine whether or not relationships are proportional by using tables and graphs. If each set of data has the same unit rate, the relationship is proportional.
Remember: To find the unit rate between two quantities, divide.

Example 1: Using the chart below, determine if there is a proportional relationship between the quantities in column A and the quantities in column B. Then, find the missing value.

A	B
12	4
18	6
30	10
x	12

Step 1: Determine the unit rate for each set of data.

The ratios of B to A: $\frac{4}{12} = \frac{1}{3}$ $\frac{6}{18} = \frac{1}{3}$ $\frac{10}{30} = \frac{1}{3}$

Compare the unit rates to see if they are equal. Since all the unit rates are equal, there is a proportional relationship between quantities in column A and quantities in column B.

Day 29

Chapter 10
Percentages

Standard(s) covered: 6.RP.A.3.c

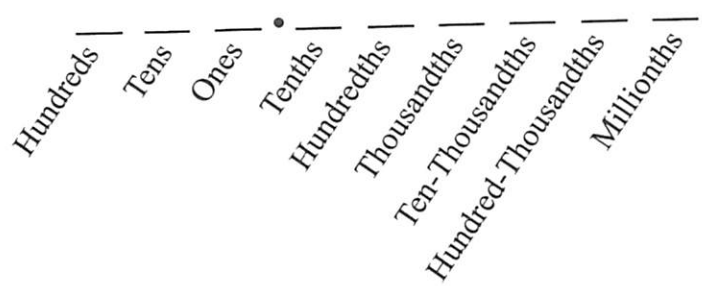
10.1 Fractions, Decimals, and Percents

The ratio of a quantity to the total may be given in the form of a fraction, decimal, or percent. To convert from a fraction to a decimal, divide the numerator (top) of the fraction by the denominator (bottom) of the fraction.

Example 1: Write $\frac{2}{5}$ as a decimal.

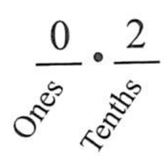
Step: Divide the numerator by the denominator.
$2 \div 5 = 0.4$

To convert a decimal to a fraction, consider the place value of the last digit in the decimal and write the fraction to correspond.



Example 2: Write 0.2 and 1.187 as fractions.

Step 1: The number 0.2 is two tenths. The digit 2 is in the tenths place, as in the following diagram.

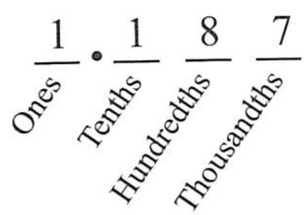


Since the 2 is in the tenths place, write $\frac{2}{10}$.

Step 2: Simplify.

$\frac{2}{10} = \frac{1}{5}$

Step 3: The number 1.187 is one and one hundred eighty-seven thousandths. The digit 7 is in the thousandths place, as in the diagram below.



Since the 7 is in the thousandths place, write $\frac{1{,}187}{1{,}000}$.

Step 4: Simplify.

$\frac{1{,}187}{1{,}000} = 1\frac{187}{1{,}000}$

Answer: The numbers 0.2 and 1.187 written as fractions are $\frac{1}{5}$ and $1\frac{187}{1{,}000}$.

Percent is part of a whole, written as a ratio to 100. To convert a percent to a fraction, divide by 100, and then simplify the fraction. To convert a fraction to a percent, write an equivalent fraction where the denominator is 100.

Example 3: Write 252% as a fraction.

Step 1: Since percent is always out of 100, we know that $252\% = \frac{252}{100}$.

Step 2: Simplify the fraction.

$\frac{252}{100} = \frac{63}{25} = 2\frac{13}{25}$

Answer: 252% written as a fraction is $\frac{63}{25}$ or $2\frac{13}{25}$.

To convert a percent to a decimal, divide by 100 (move the original decimal point two places to the left).

Example 4: 23% = 0.23   8% = 0.08   100% = 1   409% = 4.09

↑

(decimal point)

To convert a decimal to a percent, multiply the decimal by 100 (move the original decimal two places to the right).

Example 5: 0.24 = 24%   0.03 = 3%   0.2 = 20%   0.445 = 44.5%   2.37 = 237%

Day 29

Some common percent values are given as fractions and decimals below.

Percent	Fraction	Decimal
10%	$\frac{10}{100}=\frac{1}{10}$	0.1
25%	$\frac{25}{100}=\frac{1}{4}$	0.25
50%	$\frac{50}{100}=\frac{1}{2}$	0.5
75%	$\frac{75}{100}=\frac{3}{4}$	0.75
100%	$\frac{100}{100}=1$	1.0

Activity

Change the following from percent to decimal form. (DOK 1)

1. 35% _______
2. 98% _______
3. 9% _______
4. 10% _______
5. 100% _______

Change the following from decimal to percent form. (DOK 1)

6. 0.26 _______
7. 0.84 _______
8. 6.52 _______
9. 0.99 _______
10. 1.11 _______

Change the following from percent to fraction form. Simplify the fraction. (DOK 1)

11. 42% _______
12. 17% _______
13. 180% _______
14. 3% _______
15. 200% _______

For problems 16–25, complete the following table. Simplify fractions. (DOK 2)

	Fraction	Decimal	Percent
16.	$\frac{4}{5}$		
17.		0.003	
18.			83%

19.		0.333	
20.	$9\frac{3}{4}$		
21.		4.05	
22.	$\frac{3}{8}$		
23.			7%
24.		0.67	
25.			1.6%

10.2 Parts of Percents

Recall that a percent is part of a whole, written as a ratio to 100. You can use a proportion or an equation to find the number in the part of whole, the number in the whole group, or the percent.

$$\frac{\%}{100} = \frac{\text{\# in part}}{\text{\# in whole}}$$

When using proportions, recall from chapter 4 that if two ratios, $\frac{a}{b}$ and $\frac{c}{d}$, are proportional, the cross products are equal.

$$\frac{a}{b} = \frac{c}{d} \qquad \frac{a}{b} = \frac{c}{d}$$

$$ad = bc$$

When using equations, remember, "of" means times and "is" means equals. The percent of the number in the whole group is the number in the part.

(Percent as a Decimal)(# in Whole) = (# in Part)

Example 1: A restaurant decided to start serving milkshakes and took a survey on which flavor people preferred; vanilla, chocolate, or strawberry. Three-hundred people were surveyed, and the results were 30% of the people surveyed prefer vanilla, 45% of the people surveyed prefer chocolate, and the rest of the people surveyed prefer strawberry. What is the ratio of the people who prefer strawberry to the people who prefer vanilla? Write your answer in the simplest form.

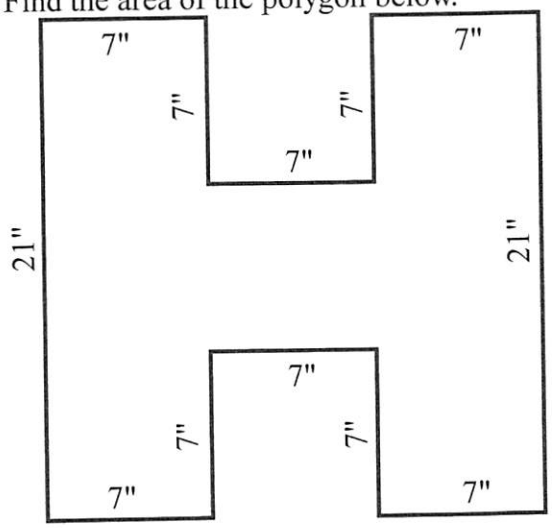
Step 1: Find the percent of people surveyed who prefer strawberry.
30% of people surveyed prefer vanilla + 45% of people surveyed prefer chocolate =75% who prefer either vanilla or chocolate. The rest of the people preferred strawberry. Subtract 75% from 100% .

Day 30

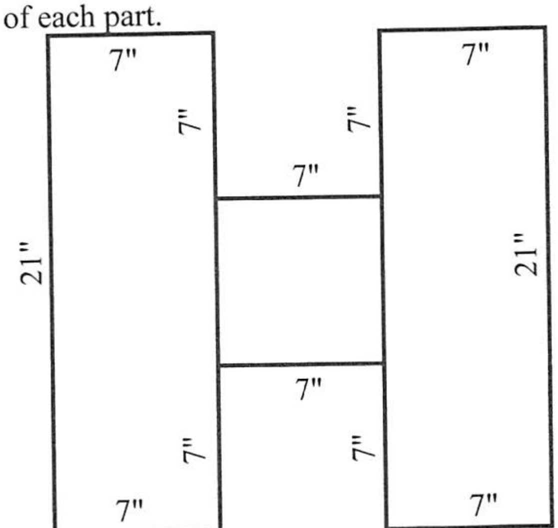
11.6 Area of Polygons

You may be asked to find the area of other polygons as well. Many polygons can be broken down into triangles, rectangles, or squares. To find the area of these polygons, look for ways to break the polygon into simpler shapes. Find the area of the simpler shapes and add them together to find the total area.

Example 1: Find the area of the polygon below.



Step 1: Determine how the polygon could be separated into simpler parts to find the area of each part.



The polygon can be separated into 2 rectangles and 1 square.

Step 2: Find the side lengths of the new figures. You can see from the figure that the rectangles measure 21 inches by 7 inches and that the square measures 7 inches on one side. Use these measurements to find the area of each new figure. $21 \times 7 = 147$ in^2 and $7 \times 7 = 49$ in^2.

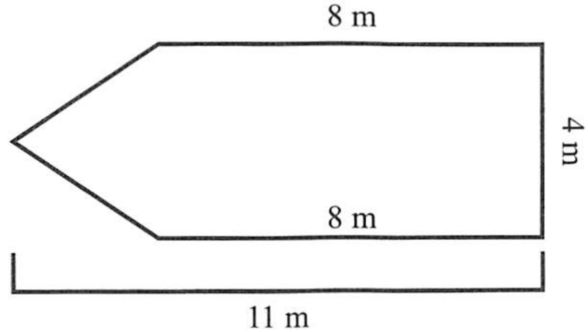
Step 3: Add up the area of each part.

One rectangle	147	in^2
One rectangle	147	in^2
One square	49	in^2
Total	343	in^2

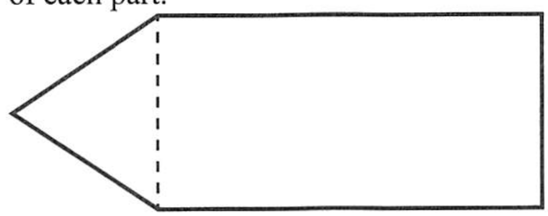
Day 30

Answer: The total area of the polygon is 343 in^2.

Example 2: Find the area of the polygon below.

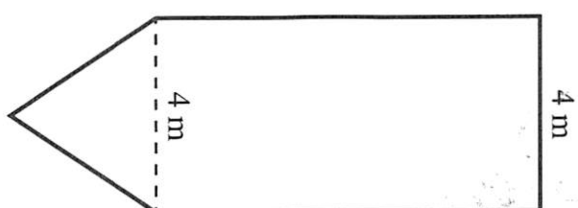


Step 1: Determine how the polygon could be separated into simpler parts to find the area of each part.

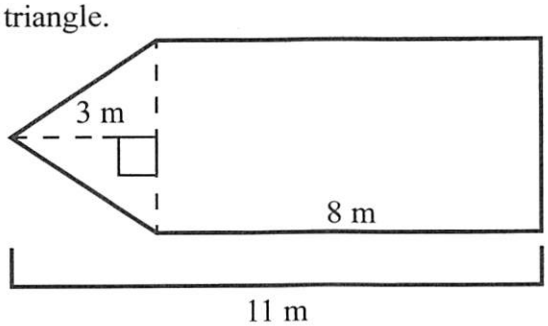


The polygon can be separated into a triangle and a rectangle.

Step 2: Find the measurements of the new figures. You can see from the figure that the rectangle measures 8 m wide by 4 m long. You have to use reasoning to find the base and height of the triangle.
Notice the base of the triangle forms one short side of the rectangle. The base of the triangle must measure 4 m.



Now see how the diagram shows that the total width of the polygon is 11 meters? Since the width of the rectangle is 8 m, you can subtract to find the height of the triangle.



Day 30

$11 - 8 = 3$, so the triangle has a height of 3 m. Now, use the measurements to find the area of the triangle and rectangle.

$\frac{1}{2} \times 4 \times 3 = 6 \text{ m}^2$ and $4 \times 8 = 32 \text{ m}^2$

Step 3: Add up the area of each part.

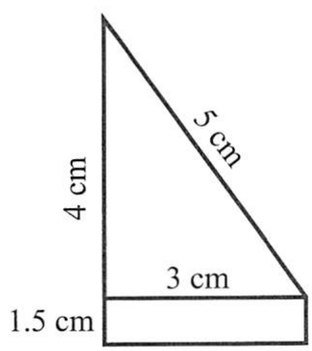
Triangle	6	m^2
Rectangle	32	m^2
Total	38	m^2

Answer: The total area of the polygon is 38 m^2.

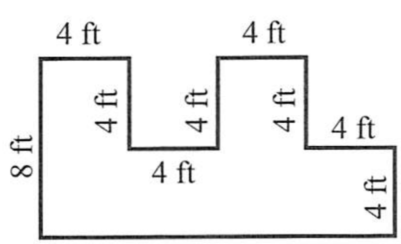
Activity

Find the area of each of the figures below. (DOK 2, 3)

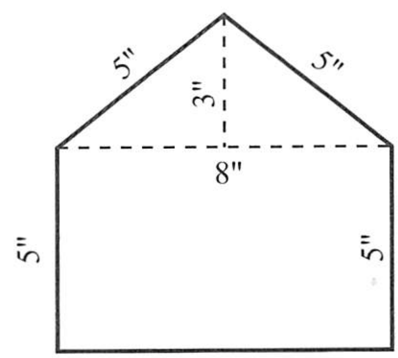
1.



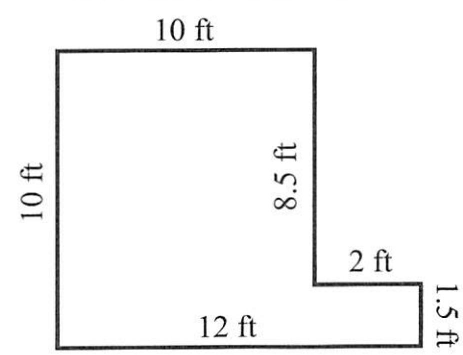
2.



3.

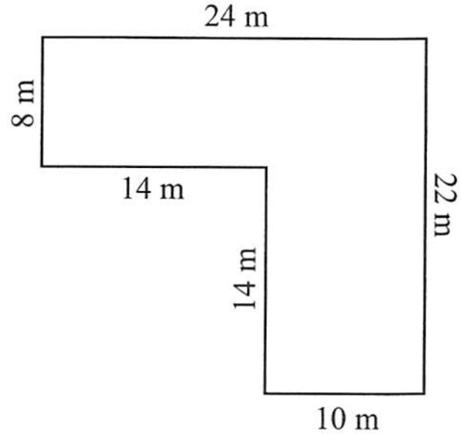


4.

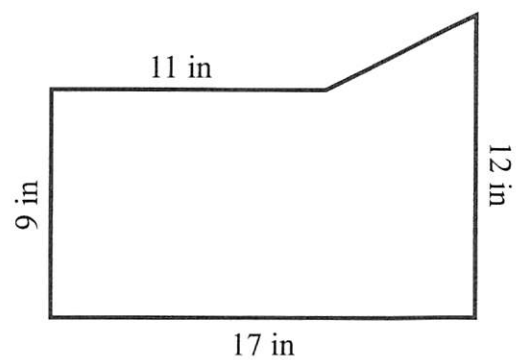


Day 30

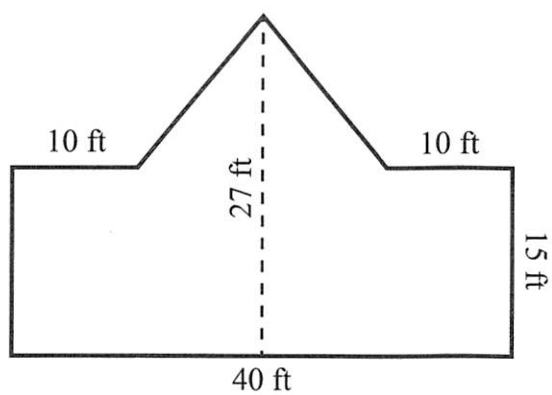
5.


24 m
8 m
14 m
22 m
14 m
10 m

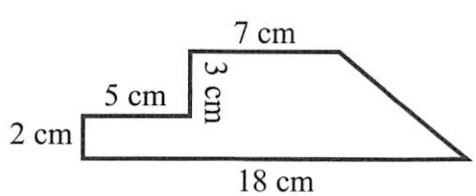
6.


11 in
12 in
9 in
17 in

7.


10 ft
10 ft
27 ft
15 ft
40 ft

8.


7 cm
3 cm
5 cm
2 cm
18 cm