

Chapter 1 Completed Graphic Organizer

Name _____

Date _____

Chapter 1

Key Words: the sum of, the total of	Adding whole numbers	Numbers: $\begin{array}{r} 12 \\ 1685 \\ 193 \\ + 270 \\ \hline 2148 \end{array}$
Real-Life Application Example: On a video game, Jacob got 1685 points and earned two bonuses worth 193 and 270 points. What is his total score? Answer: 2148 points		
Estimate and Check: $1685 + 193 + 270 \approx 1700 + 200 + 300 = 2200$ Because $2148 \approx 2200$, the answer is reasonable.		

Key Words: the difference of, how many more, how many less, the change in	Subtracting whole numbers	Numbers: $\begin{array}{r} 612 \\ 73 \\ - 58 \\ \hline 14 \end{array}$
Real-Life Application Example: On the way to school, the temperature was 58°F. On the way home, it was 72°F. How much did the temperature increase? Answer: 14°F		
Estimate and Check: $72 - 58 \approx 70 - 60 = 10$ Because $14 \approx 10$, the answer is reasonable.		

Key Words: the product of, total of equal-size groups	Multiplying whole numbers	Numbers: $\begin{array}{r} 1 \\ 24 \\ 136 \\ \times 28 \\ \hline 1088 \\ + 272 \\ \hline 3808 \end{array}$
Real-Life Application Example: How many cartons of milk should the cafeteria manager at Riverdale Middle School order so that all of the 136 students can get one carton per day in February (28 days)? Answer: 3808 cartons		
Estimate and Check: $136 \times 28 \approx 140 \times 30 = 4200$ Because $3808 \approx 4200$, the answer is reasonable.		

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Key Words: the quotient of, divide into equal-size groups, $\frac{\text{dividend}}{\text{divisor}} = \text{quotient}$	Real-Life Application Example: Sukon has a package of 587 stickers and wants to give each of his 23 classmates the same number of stickers. What is the greatest number of stickers that he can give to each classmate? How many will be left over? Answer: 25 stickers each with 12 left over	Numbers: $\begin{array}{r} 25 \text{ R}12 \\ 23 \overline{)587} \\ \underline{-46} \\ 127 \\ \underline{-115} \\ 12 \end{array}$ The quotient is $25 \frac{12}{23}$
Dividing whole numbers		
Estimate and Check: $587 \div 23 \approx 600 \div 20 = 30$ Because $25 \frac{12}{23} \approx 30$, the answer is reasonable.		

Example: $10 - 3 \times 2 + 4$ $= 10 - 6 + 4$ $= 4 + 4$ $= 8$	Procedure: 1. Perform operations in Parentheses. 2. Evaluate numbers with Exponents. 3. Multiply or Divide from left to right. 4. Add or Subtract from left to right.	Example: $16 \div 2^2 + 7 \times 5$ $= 16 \div 4 + 7 \times 5$ $= 4 + 35$ $= 39$
Order of operations		
Example: $33 - (5 - 3)^3 \div 4 \times 6 + 1 = 33 - 2^3 \div 4 \times 6 + 1$ $= 33 - 8 \div 4 \times 6 + 1$ $= 33 - 2 \times 6 + 1$ $= 33 - 12 + 1 = 22$		

Example: $\begin{array}{c} 120 \\ \swarrow \quad \searrow \\ 12 \quad 10 \\ \swarrow \downarrow \swarrow \downarrow \swarrow \downarrow \\ 2 \cdot 6 \quad 2 \cdot 5 \\ \swarrow \downarrow \swarrow \downarrow \\ 2 \cdot 3 \end{array}$ $120 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$ $= 2^3 \cdot 3 \cdot 5$	Words: Write a composite number as a product of its prime factors. Use a factor tree to find a prime factorization.	Example: $\begin{array}{c} 99 \\ \swarrow \quad \searrow \\ 9 \quad 11 \\ \swarrow \downarrow \swarrow \downarrow \\ 3 \cdot 3 \end{array}$ $99 = 3 \cdot 3 \cdot 11$ $= 3^2 \cdot 11$
Prime factorization		
Example: Find the greatest perfect square that is a factor of 252. The prime factorization is $252 = 2 \cdot 2 \cdot 3 \cdot 3 \cdot 7$. $2 \cdot 2 = 4$ $3 \cdot 3 = 9$ $(2 \cdot 3) \cdot (2 \cdot 3) = 6 \cdot 6 = 36$ So, the greatest perfect square factor of 252 is 36.		

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Words:
Factors that are shared by two or more numbers are called common factors. The greatest of the common factors is called the greatest common factor (GCF).

Example:
Find the GCF of 16 and 24.
16: ①, ②, ④, ⑧, 16
24: ①, ②, 3, ④, 6, ⑧, 12, 24
The GCF is 8.

Example:
Find the GCF of 12 and 30.
12 = 2 • 2 • 3
30 = 5 • 2 • 3
The GCF is 2 • 3 = 6.

Greatest Common Factor (GCF)

Example:
Find the GCF of 72 and 90.
72 = 2 • 2 • 2 • 3 • 3
90 = 2 • 3 • 3 • 5
The GCF is 2 • 3 • 3 = 18.

Words:
Multiples that are shared by two or more numbers are called common multiples. The least of the common multiples is called the least common multiple (LCM).

Example:
Find the LCM of 6 and 8.
6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66
8: 8, 16, 24, 32, 40, 48, 56, 64
The LCM is 24.

Example:
Find the LCM of 8 and 12.
8: 8, 16, 24, 32, 40, 48, ...
12: 12, 24, 36, 48, 60, ...
The LCM is 24.

Least Common Multiple (LCM)

Example:
Find the LCM of 9, 12, and 15.
9 = 3 • 3
12 = 2 • 2 • 3
15 = 3 • 5
The LCM is 2 • 2 • 3 • 3 • 5 = 180.

Words:
The least common denominator (LCD) of two or more fractions is the least common multiple (LCM) of the denominators.

Example:
 $\frac{3}{8} + \frac{5}{12}$
8 = 2 • 2 • 2
12 = 2 • 2 • 3
The LCD is 2 • 2 • 2 • 3 = 24.
 $\frac{3}{8} + \frac{5}{12} = \frac{9}{24} + \frac{10}{24} = \frac{19}{24}$

Example:
 $\frac{13}{15} - \frac{2}{9}$
15 = 3 • 5
9 = 3 • 3
The LCD is 3 • 3 • 5 = 45.
 $\frac{13}{15} - \frac{2}{9} = \frac{39}{45} - \frac{10}{45} = \frac{29}{45}$

Least Common Denominator (LCD)

Example:
Compare $\frac{5}{6}$ and $\frac{11}{14}$ using >, <, or =.
6 = 2 • 3
14 = 2 • 7
The LCD is 2 • 3 • 7 = 42.
 $\frac{5}{6} = \frac{35}{42}$ and $\frac{11}{14} = \frac{33}{42}$
So, $\frac{5}{6} > \frac{11}{14}$.