

1. a) $\underbrace{1 + 2}_{3} + \underbrace{3 + 4}_{6} + \underbrace{5 + 6}_{10} + \underbrace{7}_{15} = \boxed{28}$

b) $\underbrace{(1 + 2 + 3)}_6 + \underbrace{(4 + 5 + 6 + 7)}_{22} = \boxed{28}$

c) $\underbrace{(1 + 2 + 3 + 4 + 5)}_3 + \underbrace{(6 + 7)}_{13} = \boxed{28}$

d) $\underbrace{(1 + 2)}_3 + \underbrace{3}_3 + \underbrace{(4 + 5 + 6 + 7)}_{22} = \boxed{28}$

e) $\underbrace{7 + 6}_{13} + \underbrace{5 + 4}_{18} + \underbrace{3 + 2}_{22} + \underbrace{1}_{25} = \boxed{28}$

f) $\underbrace{(7 + 6 + 5 + 4)}_{13} + \underbrace{3}_{18} + \underbrace{2}_{22} + \underbrace{1}_{27} = \boxed{28}$

g) $\cancel{4} + \cancel{1} + \cancel{2} + \cancel{7} + \cancel{3} + \cancel{5} + \cancel{6} = \boxed{28}$

h) Did you get the same answer for #1a-g? *yes*

i) What mathematical property says you can add numbers in any order? *commutative and (associative)*

2. a) $2 \times 3 = 6$

b) $\underline{-2} \times 3 = \underline{-6}$

c) $2 \times \underline{-3} = \underline{-6}$

d) $-2 \times -3 = 6$

e) What is the sign of the result when you multiply:

positive \times positive = $+$

negative \times negative = $+$

negative \times positive = $-$

positive \times negative = $-$

3. Solve. Label as "identity" or "negation."

a) $951,212 \times 1 = 951,212$ identity

b) $951,212 \times -1 = -951,212$ negation

c) $-951,212 \times 1 = -951,212$ identity

d) $-951,212 \times -1 = 951,212$ negation

4. a) $9 \div 3 = 3$

b) $-9 \div 3 = -3$

c) $9 \div -3 = -3$

d) $-9 \div -3 = 3$

e) Are the sign rules for division the same or different than multiplication (see #2e)? *same*

5. Solve. Label as "identity" or "negation."

a) $1,234,567 \div 1 = 1,234,567$ identity

b) $1,234,567 \div -1 = -1,234,567$ negation

c) $-1,234,567 \div 1 = -1,234,567$ identity

d) $-1,234,567 \div -1 = 1,234,567$ negation

5. Solve. Label as "identity" or "negation."

a) $1,234,567 \div 1 =$ _____

b) $1,234,567 \div -1 =$ _____

c) $-1,234,567 \div 1 =$ _____

d) $-1,234,567 \div -1 =$ _____

$$\begin{aligned} 6. \quad & \frac{(1+2) \div 3 + 4 \times 5 - (6+7)}{3 \div 3 + 4 \times 5 - 13} = \boxed{8} \\ & = 1 + 20 - 13 \\ & = 8 \end{aligned}$$

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7. a) $-1 + \frac{-2}{-3} + \frac{-3}{-6} + \frac{-4}{-10} + \frac{-5}{-15} + \frac{-6}{-21} + \frac{-7}{-21} = \boxed{-28}$

b) $-1 - 2 - 3 - 4 - 5 - 6 - 7 = \boxed{-28}$
 $\frac{-3}{-3} \frac{-6}{-6} \frac{-10}{-10} \frac{-15}{-15} \frac{-21}{-21}$

c) $\frac{-1}{-1} + \frac{-1 \times 2}{-2} + \frac{-1 \times 3}{-3} + \frac{-1 \times 4}{-4} + \frac{-1 \times 5}{-5} + \frac{-1 \times 6}{-6} + \frac{-1 \times 7}{-7} = \boxed{-28}$

d) $-1 + \frac{-1 \times 2}{-2} + \frac{-1 \times 3}{-3} + \frac{-1 \times 4}{-4} + \frac{-1 \times 5}{-5} + \frac{-1 \times 6}{-6} + \frac{-1 \times 7}{-7} = \boxed{-28}$

e) $-1 + \frac{2 \div -1}{-2} + \frac{3 \div -1}{-3} + \frac{4 \div -1}{-4} + \frac{5 \div -1}{-5} + \frac{6 \div -1}{-6} + \frac{7 \div -1}{-7} = \boxed{-28}$

8. 2 a) $-2 \times -2 = 4$

3 b) $\underbrace{-2 \times -2}_{4} \times -2 = -8$

4 c) $\underbrace{-2 \times -2}_{-8} \times -2 \times -2 = 16$

5 d) $\underbrace{-2 \times -2}_{16} \times -2 \times -2 \times -2 = -32$

e) What is the sign for multiplying an odd number of negative numbers?
 negative