Pre-Algebra: Exam 1 Solutions

1. Order from smallest to largest:

   (a)

   $$-3, 0, -25, 3 \tag{1}$$

   SOLUTION

   $$-25 < -3 < 0 < 3$$

   (b)

   $$\frac{1}{10}, \frac{1}{100}, 1\frac{1}{5} \tag{2}$$

   SOLUTION

   $\frac{1}{100} < \frac{1}{10} < 1\frac{1}{5}$

2. Solve:

(a)

$$n - 5 = -2 \tag{3}$$

SOLUTION

$$n = 5 - 2$$

$$n = 3$$

(b)

$$x - \frac{1}{4} = 3\frac{1}{8} \tag{4}$$

SOLUTION

$$x = 3\tfrac{1}{8} + \tfrac{2}{8}$$

$$x = 3\tfrac{3}{8}$$

3. Combine:

(a)

$$\frac{1}{3} + \frac{1}{3} \tag{5}$$

SOLUTION

$= \frac{2}{3}$

(b)

$$\frac{1}{3} + \frac{1}{5} \tag{6}$$

SOLUTION

$\frac{5}{15} + \frac{3}{15}$

$= \frac{8}{15}$

(c)

$$1\frac{1}{8} - 2\frac{3}{32} \tag{7}$$

SOLUTION

$1\frac{4}{32} - 2\frac{3}{32}$

$= -\frac{31}{32}$

4. Seven people are sharing a pizza. Two greedy people eat $\frac{1}{4}$ of the pizza each, while a third person eats $\frac{1}{6}$. If we divide the remaining pizza evenly among the remaining people, how much do they each get?

SOLUTION

How much pizza has been eaten?

$\frac{1}{4} + \frac{1}{4} + \frac{1}{6}$
$\frac{1}{2} + \frac{1}{6}$
The LCD is 6.
$\frac{3}{6} + \frac{1}{6}$
$\frac{4}{6}$ or $\frac{2}{3}$
Therefore, there is $\frac{3}{3} - \frac{2}{3} = \frac{1}{3}$ of the pizza remaining.

The number of people remaining is 7 - 3 = 4 people to share the remaining pizza. So each remaining person gets
$(\frac{1}{4})(\frac{1}{3}) = \frac{1}{12}$ of the pizza.

5. (a) Find the Greatest Common Factors of the following pairs of numbers:
(a) (8,32) (b) (21,49) (c) (39,57)

SOLUTION
(a) by prime factorization:
8: $2 \times 2 \times 2$ 32: $2 \times 2 \times 2 \times 2 \times 2$ The GCF is the largest subset in common between the two, in this case $2 \times 2 \times 2$ or **8**. (b)

21: 3×7
49: 7×7
GCF: 7
(c)

39: 3×13
57: 3×19
GCF: 3

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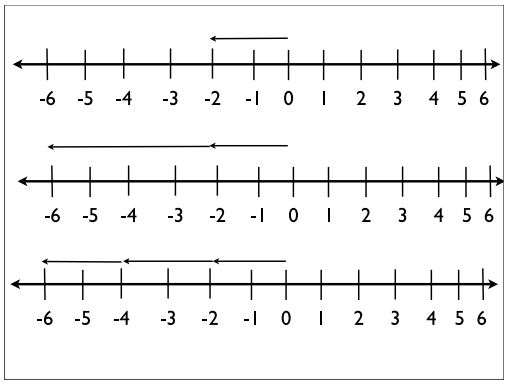
(b) Find the Least Common Multiple of each pair of numbers:
(a) (9,15) (b) (12,14) (c) (18,7)
(a) by prime factorization:
9: 3×3
15: 3×5
The LCM is the set of primes that includes both prime factorizations as subsets.
In this case $3 \times 3 \times 5 =$ **45**
(b) 12: $2 \times 2 \times 3$
14: 2×7
LCM: $2 \times 2 \times 3 \times 7 =$ **84**
(c) 18: 9×2
7: **7**
LCM:$9 \times 2 \times 7 =$ **126**

6. (a) What sums do the following number lines represent?



SOLUTION

(a) $0 - 2 = -2$

(b) $-2 - 4 = -6$

(c) $-2 - 2 - 2 = -6$ or $-2 \times 3 = 6$

(b) Solve:

(a) $n = 5 + 2 \times 4$

SOLUTION

$n = 5 + 8 = \mathbf{13}$

(b) $x = 4 \times -2 + 6$

SOLUTION

$x = -8 + 6 = \mathbf{-2}$

(c) $y = -9 \div 3 + 2$

SOLUTION $y = -3 + 2 = \mathbf{-1}$

7. Solve:

$$\frac{1}{3}x + \frac{1}{2} = \frac{2}{5} \tag{8}$$

SOLUTION First multiply both sides by the LCM. LCM = 30. Multiply all terms by 30 to get:

$10x + 15 = 12$

Now solve:

Subtract 15 from both sides:

$10x = -3$

Divide by 10:

$x = -\mathbf{\frac{3}{10}}$

8. The price of grapefruits is 25% less this week than it was last week. If grapefruits cost \$3 per pound this week, what was their cost last week?

SOLUTION

Let my variable be x, the price of grapefruit *last* week. Then I can write:

$x - \frac{1}{4} * x = 3$

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

$x = 3(\frac{4}{3})$

$x = 4$

The grapefruits cost **\$4 per pound** last week.