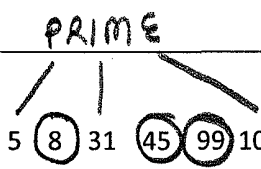


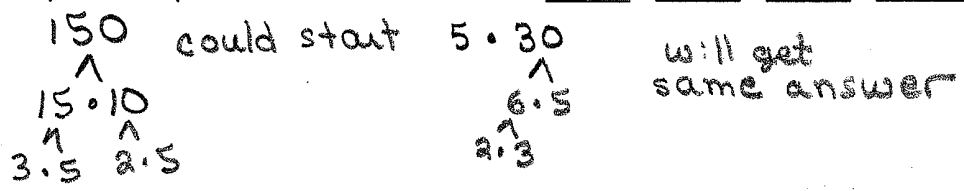
To the Test – be sure to bring:

- (1) your personally-prepared 8 ½ " by 11" study guide for this test
- (2) your simple, non-graphing calculator and
- (3) your pencils
- (4) your BluGold ID

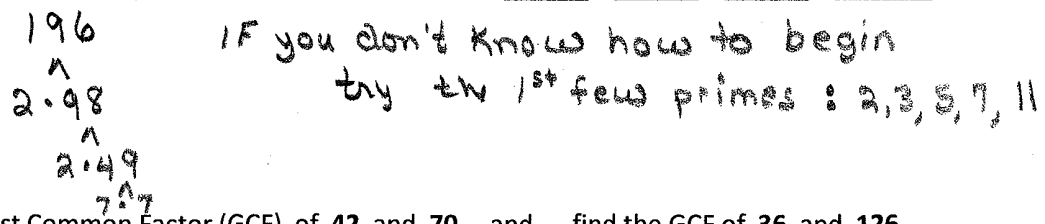


1. Prime or Composite: Which of the following are COMPOSITE numbers? 5 (8) 31 (45) (99) 101

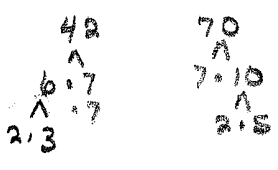
2. Write 150 as a product of prime factors. Your answer: 2 x 3 x 5 x 5



Write 196 as a product of prime factors. Your answer: 2 x 2 x 7 x 7



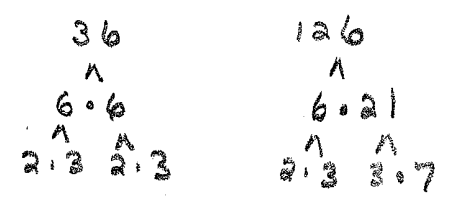
3. Find the Greatest Common Factor (GCF) of 42 and 70 and find the GCF of 36 and 126.



42 : 2 · 3 · 7  
70 : 2 · 7 · 5

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GCF : 2 · 7



36 : 2 · 2 · 3 · 3  
126 : 2 · 3 · 3 · 7

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GCF : 2 · 3 · 3

GCF : 2 · 7 = **14**

4. Write these fractions in simplest form:  $\frac{42}{70}$  and  $\frac{36}{126}$  and  $\frac{84}{210}$

$\frac{42}{70} \div \frac{7}{7} = \frac{6}{10} \div \frac{2}{2} = \frac{3}{5}$

could have used 14! the GCF  $\frac{42}{70} \div \frac{14}{14} = \frac{3}{5}$

$\frac{36}{126} \div \frac{18}{18} = \frac{2}{7}$

$\frac{84}{210} \div \frac{7}{7} = \frac{12}{30} \div \frac{3}{3} = \frac{4}{10} \div \frac{2}{2} = \frac{2}{5}$

IF you don't know, Keep reducing by primes!

5. Find the product. Simplify.

$$\frac{\overset{1}{\cancel{2}} \cdot \overset{1}{\cancel{5}} \cdot \overset{4}{\cancel{16}}}{\underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{8}} \cdot 49} \text{ and } \frac{\overset{1}{\cancel{4}} \cdot \overset{3}{\cancel{15}} \cdot \overset{1}{\cancel{6}}}{\underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{24}} \cdot 7} = \frac{3}{7}$$

$\frac{4}{49}$  ←

6. Find the quotient. Simplify.

$$\frac{5}{7} \div \frac{15}{28} \text{ and } \frac{9}{16} \div \frac{27}{36}$$

$$\frac{\overset{1}{\cancel{5}} \cdot \overset{4}{\cancel{28}}}{\underset{1}{\cancel{7}} \cdot \underset{3}{\cancel{15}}} = \frac{4}{3} \quad \text{and} \quad \frac{\overset{1}{\cancel{9}} \cdot \overset{4^3}{\cancel{36}}}{\underset{4}{\cancel{16}} \cdot \underset{3}{\cancel{27}}} = \frac{3}{4}$$

7. Solve the equation for the value of  $x$ :

$$\frac{12x}{12} = \frac{144}{12} \quad \text{and} \quad \frac{-9x}{-9} = \frac{63}{-9}$$

$$x = 12 \quad x = -7$$

$$\{12\} \quad \{-7\}$$

8. Solve the equation for the value of  $x$ :

$$7x - 27 = 2x - 2 \quad \text{and} \quad 3x + 7 = 6x - 2$$

$$+27 = +27 \quad +2 \quad +2$$


---


$$7x = 2x + 25 \quad 3x + 9 = 6x$$

$$-2x = -2x \quad -3x = -3x$$


---


$$5x = 25 \quad 9 = 3x$$

$$\frac{5}{5} = \frac{25}{5} \quad \frac{9}{3} = \frac{3x}{3}$$

$$x = 5 \quad 3 = x$$

$$\{5\} \quad \{3\}$$

larger number of  $x$  so keep here

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9. Solve the equation for the value of  $x$ :

$$9(x-4) - 5x = x + 6$$

combine

$$9x - 36 - 5x = x + 6$$

$$4x - 36 = x + 6$$

$$4x - 36 + 36 = x + 6 + 36$$


---


$$4x = x + 42$$

$$-x = -x$$


---


$$3x = 42$$

$$\frac{3x}{3} = \frac{42}{3}$$

$$x = 14$$

$$\{14\}$$

and

$$7(x-9) = 7x - 18$$

$$7x - 63 = 7x - 18$$

$$+63 = +63$$


---


$$7x = 7x + 45$$

$$-7x = -7x$$


---


$$0 = 45$$

FALSE statement

NO solution

$\emptyset$  ← empty set symbol

10. Find the difference.

$$\frac{-2}{17} - \frac{9}{17} \quad \text{and} \quad \frac{2}{15} - \frac{4}{15} + \frac{7}{15}$$

$$-\frac{2}{17} - \frac{9}{17} = \frac{-11}{17}$$

$$\frac{2}{15} - \frac{4}{15} + \frac{7}{15}$$

$$-\frac{2}{15} + \frac{7}{15} = \frac{5}{15} = \frac{1}{3}$$

11. Add the fractions

$$\frac{2}{9} + \frac{5}{27}$$

and

$$\frac{4}{15} + \frac{3}{10}$$

LCD of 15 and 10 is 30

Find common denominator  
LCD of 9+27  
6+27

$$\frac{2}{9} \cdot \frac{3}{3}$$

$$\frac{6}{27} + \frac{5}{27} = \frac{11}{27}$$

$$\frac{4}{15} \cdot \frac{2}{2} + \frac{3}{10} \cdot \frac{3}{3}$$

$$\frac{8}{30} + \frac{9}{30} = \frac{17}{30}$$

12. Multiply and simplify if necessary.

$$2\frac{3}{4} \cdot 3\frac{4}{5}$$

and

$$\frac{2}{3} \cdot 1\frac{4}{5} \cdot \frac{5}{8}$$

convert to improper

$$\frac{2 \cdot 4 + 3}{4} = \frac{11}{4} \quad \frac{3 \cdot 5 + 4}{5} = \frac{19}{5}$$

$$\frac{2}{3} \cdot \frac{9}{5} \cdot \frac{5}{8} = \frac{3}{4}$$

$$\frac{11}{4} \cdot \frac{19}{5} = \frac{209}{20}$$

13. Divide and simplify if necessary.  $3\frac{1}{5} \div 2\frac{2}{5}$  and  $6 \div 4\frac{4}{5}$

$$3\frac{1}{5} \div 2\frac{2}{5} = \frac{3 \cdot 5 + 1}{5} \div \frac{2 \cdot 5 + 2}{5} = \frac{16}{5} \div \frac{12}{5}$$

$$\frac{16}{5} \cdot \frac{5}{12} = \frac{4}{3}$$

$$6 \div 4\frac{4}{5} = \frac{6}{1} \div \frac{4 \cdot 5 + 4}{5} = \frac{6}{1} \div \frac{24}{5}$$

$$\frac{6}{1} \cdot \frac{5}{24} = \frac{5}{4}$$

14. Add or Subtract.  $-3\frac{4}{15} + 4\frac{3}{20}$  and  $5\frac{5}{13} - 2\frac{11}{13}$  and  $5\frac{11}{12} - 2\frac{3}{8}$

Need common denominators

LCD = 60

$15 \cdot 4 = 60$     $20 \cdot 3 = 60$

$5\frac{5}{13} = \frac{18}{13}$

LCD = 24

$$-3\frac{16}{60} + 4\frac{9}{60}$$

$$5\frac{5}{13} - 2\frac{11}{13}$$

$$5\frac{22}{24} - 2\frac{9}{24}$$

$$2\frac{7}{13}$$

$$3\frac{13}{24}$$

$$34\frac{9}{60} = \frac{69}{60}$$

$$-3\frac{16}{60}$$

$$\frac{53}{60}$$

15. Divide and simplify if necessary.

$$\frac{5}{8} \div \frac{3}{4}$$

and

$$5 + \frac{1}{5} \div 17 - \frac{3}{10}$$

must be single fractions

$$5 + \frac{1}{5} = \frac{25}{5} + \frac{1}{5} = \frac{26}{5}$$

$$\frac{5}{8} \div \frac{3}{4}$$

$$\frac{5}{8} \cdot \frac{4}{3} = \frac{5}{6}$$

$$\frac{26}{5} \div \frac{167}{10}$$

$$17 - \frac{3}{10} = \frac{170}{10} - \frac{3}{10} = \frac{167}{10}$$

$$\frac{26}{5} \cdot \frac{10}{167} = \frac{52}{167}$$

16. You have  $\frac{7}{8}$  yards (yd) of material. You want to make one placemat. The instructions say  $\frac{5}{6}$  yd of

material is needed to make one placemat. After you make the one placemat, how much material will be left?

$$\frac{7}{8} - \frac{5}{6}$$

$$\frac{7}{8} \cdot \frac{3}{3} = \frac{21}{24}$$

$$\frac{5}{6} \cdot \frac{4}{4} = \frac{20}{24}$$

LCD = 24

$$\frac{21}{24} - \frac{20}{24} = \frac{1}{24} \text{ yard}$$

17. If a meat plant packages hamburger in  $1\frac{3}{8}$  pound packages and the batch of beef to package weighs  $9\frac{5}{8}$  pounds, how many packages can be made?

$$\frac{9\frac{5}{8}}{1\frac{3}{8}} \Rightarrow \frac{9 \cdot 8 + 5}{8} \Rightarrow \frac{77}{8} = \frac{77}{8} \div \frac{11}{8} = \frac{77}{8} \cdot \frac{8}{11} = \frac{77}{11} = 7 \text{ packages}$$

- Chuck needs three shelves, one  $10\frac{3}{8}$  inches long and the other two each  $16\frac{1}{4}$  inches long. If he cuts the shelves out of a piece of lumber that is 48 inches long, approximately how much wood will he have left?

$$10\frac{3}{8} + 16\frac{1}{4} + 16\frac{1}{4} =$$

$$10\frac{3}{8} + 16\frac{2}{8} + 16\frac{2}{8} = 42\frac{7}{8}$$

$$48\frac{0}{8} - 42\frac{7}{8} = 5\frac{1}{8} \text{ inches left}$$

18. Solve the equation for the value of  $x$ :

$$\frac{x}{8} = -7$$

$$\text{and } \frac{3x}{5} = \frac{3}{10}$$

$$8(-7) = x$$

$$-56 = x$$

$$\{-56\}$$

$$(3x)(10) = 3(5)$$

$$\frac{30x}{30} = \frac{15}{30}$$

$$x = \frac{15}{30} = \frac{1}{2} \left\{ \frac{1}{2} \right\}$$

19. Solve the equation for the value of  $x$ :

$$\frac{x}{5} - \frac{1}{15} = \frac{6x+13}{75}$$

To eliminate denominators multiply all fractions by the LCD which is 75

IF the correct LCD is selected, ALL denominators are eliminated.

$$\frac{x}{5} \cdot 75 - \frac{1}{15} \cdot 75 = \frac{6x+13}{75} \cdot 75$$

$$15x - 5 = 6x + 13$$

$$\frac{15x}{-6x} - 5 = \frac{6x+13}{-6x} + 5$$

$$\frac{9x}{9} = \frac{18}{9} \quad x = 2 \quad \{2\}$$

$$\text{And } \frac{x}{20} - \frac{1}{10} = \frac{2}{5} \quad \text{and} \quad \frac{x}{4} - \frac{1}{6} = \frac{4x-5}{12} \quad \text{and}$$

$$\text{LCD} = 20$$

$$\frac{x}{20} \cdot 20 - \frac{1}{10} \cdot 20 = \frac{2}{5} \cdot 20$$

$$\frac{x-2}{+2} = \frac{8}{+2}$$

$$x = 10 \quad \{10\}$$

$$\text{LCD} = 12$$

$$\frac{x}{4} \cdot 12 - \frac{1}{6} \cdot 12 = \frac{4x-5}{12} \cdot 12$$

$$\frac{3x-2}{+5} = \frac{4x-5}{+5}$$

$$\frac{3x+3}{-3x} = \frac{4x-5}{-3x} \quad \{3\}$$

$$3 = 2$$

$$\frac{3}{4}x - 2 = 7$$

$$\text{LCD} = 4$$

$$\frac{3}{4}x \cdot 4 - 2 \cdot 4 = 7 \cdot 4$$

↑ ?  
must multiply  
whole numbers  
too!

$$\frac{3x-8}{+8} = \frac{28}{+8}$$

$$\frac{3x}{3} = \frac{36}{3} \quad \{12\}$$

$$x = 12$$

20. The sum of two consecutive odd integers is 72. Find the two integers.

$$x, x+2$$

$$x + (x+2) = 72$$

$$\frac{2x+2}{-2} = \frac{72}{-2}$$

$$2x = 70$$

$$\frac{2x}{2} = \frac{70}{2}$$

$$x = 35$$

$$x = 35$$

$$x+2 = 37$$

The integers are 35 and 37.

Larry is 4 years older than Susan, and Nathan is twice as old as Susan. If the sum of their ages is 32 years, find each of their ages.

$$\text{Larry} = S + 4 \quad \text{Nathan} = 2S$$

$$\text{Susan} = S$$

$$S + (S+4) + 2S = 32$$

$$4S + 4 = 32$$

$$\frac{4S+4}{-4} = \frac{32}{-4}$$

$$\frac{4S}{4} = \frac{28}{4}$$

$$S = 7$$

$$S+4 = 11$$

$$2S = 14$$

Susan is 7  
Larry is 11  
Nathan is 14

Fran worked twice as many hours as Jerry. Marcia worked 7 more hours than Jerry.

If they worked a total of 27 hours, find out how many hours each worked.

Let  $J$  represent the number of hours Jerry worked.

$$\text{Jerry} = J$$

What **expression**, in terms of  $J$ , represents the number of hours Fran worked?

$$\text{Fran} = \underline{2J}$$

What **expression**, in terms of  $J$ , represents the number of hours Marcia worked?

$$\text{Marcia} = \underline{J+7}$$

What **equation** represents this problem?

$$\underline{J + 2J + J + 7} = \underline{27}$$

$$\frac{4J+7}{-7} = \frac{27}{-7}$$

$$\frac{4J}{4} = \frac{20}{4}$$

$$J = 5$$

Jerry worked 5 hours.  
Fran worked 10 hours.  
Marcia worked 12 hours.

$$\underline{27}$$