$\frac{104}{104} = 100$

MLCS 0099
University of North Georgia
Summer 2015
Exam #2

Name: Key Date: July 16, 2015

Identify the number as either prime or composite by "decomposing" the number as done in class.

1) 63 $= 3^2 \cdot 7$ Composite

$63 = 3 \cdot 21$

$21 = 3 \cdot 7$

2) 109 $= 1 \cdot 109$ Prime

$1 \cdot 109$

Write the prime factorization of the number. Use exponents when possible.

3) 6500

$6500 = 5 \cdot 1300$

$1300 = 5 \cdot 260$

$260 = 5 \cdot 52$

$52 = 2 \cdot 26$

$26 = 2 \cdot 13$

$6500 = 2^2 \cdot 5^3 \cdot 13$

Find the GCD and LCM for the pair of natural numbers.

4) 56, 96

$56 = 2 \cdot 28$

$28 = 2 \cdot 14$

$14 = 2 \cdot 7$

$96 = 2 \cdot 48$

$48 = 2 \cdot 24$

$24 = 2 \cdot 12$

$12 = 2 \cdot 6$

$6 = 2 \cdot 3$

$56 = 2 \cdot 2 \cdot 2 \cdot 7$

$96 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

$GCD = 2 \cdot 2 \cdot 2 = 8$

$LCM = 2^5 \cdot 3 \cdot 7 = 672$

Rewrite the subtraction problem as an addition problem.

5) (−47) − (+32)

$(-47) + (-32)$

Subtract.

6) (+25) − (−23)

$25 + 23 = \boxed{48}$

Use the *Fundamental Principle of Fractions on questions #7 through #12*

State whether the fractions are equal or not equal. Show why.

7) $\frac{3}{5}, \frac{6}{9}$ LCD = 45

$\frac{3}{5} \cdot \frac{9}{9} = \frac{27}{45}$

$\frac{6}{9} \cdot \frac{5}{5} = \frac{30}{45}$

$\frac{27}{45} < \frac{30}{45}$ Not Equal

State whether the fractions are equal or not equal. Show why.

8) $\frac{5}{8}, \frac{85}{136}$ LCD = 136

$\frac{5}{8} \cdot \frac{17}{17} = \frac{85}{136}$

$\frac{85}{136} \cdot \frac{1}{1} = \frac{85}{136}$

Equal

Reduce the fraction.

9) $\frac{99}{156} = \frac{3 \cdot 3 \cdot 11}{2 \cdot 2 \cdot 3 \cdot 13}$

$= \boxed{\frac{33}{52}}$

156
(3) · 78
(2) · 39
(3) · (13)

Simplify.

10) $\frac{2}{3} + \frac{1}{12}$ LCD: 12

$\frac{2}{3} \cdot \frac{4}{4} = \frac{8}{12}$ $\quad \frac{8}{12} + \frac{1}{12} = \frac{9}{12} = \frac{3 \cdot 3}{3 \cdot 4} = \boxed{\frac{3}{4}}$

11) $\frac{1}{5} - \frac{1}{11}$ LCD: 55

$\frac{1}{5} \cdot \frac{11}{11} = \frac{11}{55}$

$\frac{1}{11} \cdot \frac{5}{5} = \frac{5}{55}$ $\quad \frac{11}{55} - \frac{5}{55} = \frac{11-5}{55} = \boxed{\frac{6}{55}}$

12) $\frac{1}{3} + \frac{4}{12} + \frac{5}{6}$ LCD: 12

$\frac{1}{3} \cdot \frac{4}{4} = \frac{4}{12}$

$\frac{5}{6} \cdot \frac{2}{2} = \frac{10}{12}$ $\quad \frac{4}{12} + \frac{4}{12} + \frac{10}{12} = \frac{4+4+10}{12} = \frac{18}{12}$

$= \frac{2 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 3} = \boxed{\frac{3}{2}}$

Convert the improper fraction to a mixed number.

13) $\frac{10}{3}$

$3\overline{)10}$ R 1

-9

1

$3\frac{1}{3}$

Convert the mixed number to an improper fraction.

14) $22\frac{13}{19}$

$\frac{22 \cdot 19 + 13}{19} = \boxed{\frac{431}{19}}$

Write the fraction in decimal notation. You MUST show the actual calculations for credit!

15) $\frac{13}{16}$

$$\begin{array}{r} 0.8125 \\ 16\overline{)13.0} \\ 128 \\ \hline 20 \\ 16 \\ \hline 40 \\ 32 \\ \hline 80 \\ 80 \\ \hline 0 \text{ remainder} \end{array}$$

$\boxed{0.8125}$

Find the rational fraction in lowest terms represented by the periodic decimal.

16) $0.\overline{29}$

Let $x = 0.292929\ldots$

$100x = 29.2929\ldots$

$x = 0.2929\ldots$

$99x = 29$

$x = \boxed{\frac{29}{99}}$

Simplify.

17) $\sqrt{72}$

$\sqrt{36 \cdot 2} = \sqrt{36} \cdot \sqrt{2}$

$= \boxed{6\sqrt{2}}$

Rationalize the denominator.

18) $\frac{13}{\sqrt{13}} \cdot \frac{\sqrt{13}}{\sqrt{13}} = \frac{13\sqrt{13}}{13} = \boxed{\sqrt{13}}$

Use the rules for exponents to rewrite the expression and then evaluate the new expression.

19) $2^5 \cdot 2^2$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^{5+2=7} = 2^7$

$= \boxed{128}$

Express the number in scientific notation.

20) 74.8499

7.48499×10^{1}

21) 0.00000046207

4.6207×10^{-7}

Write the number in standard notation.

22) 4.12×10^{7}

41,200,000 41,200,000

23) 9.0797×10^{-7}

0.00000090797 0.00000090797

Find the number of subsets of the set.

24) {0}

$\emptyset$ & {0} Two Subsets

Decide whether the argument is an example of inductive or deductive reasoning.

25) Fresh fruit costs more in winter. This is January. These fresh strawberries cost more.

Deductive

Accepted fact

26) Use *Algebra's Power Tools to solve the equation by stating each step with the appropiate tool.*

$3(x + 4) + 5x = 10x - 10$

$3x + 12 + 5x = 10x - 10$ Dist

$(3x + 12) + 5x = 10x - 10$ Assoc.

$(12 + 3x) + 5x = 10x - 10$ Comm.

$12 + (3x + 5x) = 10x - 10$ Assoc.

$12 + 8x = 10x - 10$

$22 = 2x$ A. I.

$11 = x$ M. I.