Jakarta International School

7th Grade

Name: MASTER

Date: _____

Practice Test - BLUE

Operations with Fractions

Score: $\frac{}{30}$

Clearly SHOW or EXPLAIN how you arrive at ALL your answers !!!

1. Explain why the least common multiple of any two numbers is divisible by the greatest common factor of the numbers. **(1 pts)**

   Since the LCM is a multiple of the two numbers, both numbers are factors of the LCM. The GCF is a factor of both numbers and thus a factor of the LCM.

2. The R-Value of a building material measures how well the material keeps heat in or out. The greater the R-value, the better the insulating capability. Use the table below. List the materials in order from least to greatest R-Value. **(2pts)**

   ① Stucco, ② Brick, ③ Asphalt Shingle, ④ Plywood, ⑤ Wood Siding,

   $\frac{4}{11} = 0.\overline{36}$ $\frac{2}{5} = .4$ $\frac{5}{12} = .41\overline{6}$ $\frac{1}{2} = .5$ $.75$

   ⑥ Wood Shingle $\frac{11}{12}$

Material	R-Value
Plywood	$\frac{1}{2}$
Asphalt shingle	$\frac{5}{12}$
Brick	$\frac{2}{5}$
Stucco	$\frac{4}{11}$
Wood siding	$\frac{3}{4}$
Wood shingle	$\frac{11}{12}$

3. Write the following decimal as a fraction $.\overline{897}$ **(2 pts)**

   $$n = .\overline{897}$$

   $$1000n = 897.\overline{897}$$
   $$- \quad n \qquad -.\overline{897}$$
   $$999n = 897$$

   $$n = \frac{897 \div 3}{999 \div 3} \qquad \boxed{n = \frac{299}{333}}$$

4. Order from least to greatest: $-1.\overline{8}, .18, \frac{21}{18}, -1.88, .1\overline{8}, 1.18, \frac{6}{5}$ (2 pts) .

$$-1.\overline{8}, -1.88, .18, .1\overline{8}, \frac{21}{18}, 1.18, \frac{6}{5}$$

5. Fisher wrote a book about bugs. He created the front cover, spine, and back cover from one continuous piece of $\frac{2}{5}$ inch thick cardboard. The cardboard fits exactly over the pages, and the final dimensions of the book are $6\frac{1}{2}$ inches by $8\frac{1}{4}$ inches by 2 inches. If the entire cardboard piece (front, spine and back) were removed, what would be the sum of the length, width, and thickness of the remainder of the book (the remaining stack of paper pages)? Express your answer as a mixed number. (2pts)

$2 - 2\left(\frac{2}{5}\right) = 2 - \frac{4}{5} = 1\frac{1}{5}$ inches. (thickness of pages).

$6\frac{1}{2} - \frac{2}{5} = 6\frac{5}{10} - \frac{4}{10} = 6\frac{1}{10}$ inches (width of pages)

Length → Still $8\frac{1}{4}$ inches.

Sum:

$8\frac{1}{4} + 6\frac{1}{10} + 1\frac{1}{5}$

$8\frac{5}{20} + 6\frac{2}{20} + 1\frac{4}{20} = 15\frac{11}{20}$ inches

6. Express the sum in simplest form (2pts) $\dfrac{4w+x}{w^2x} + \dfrac{5w-2x}{wx^2}$

$$\boxed{\dfrac{x^2 + 5w^2 + 2wx}{w^2x^2}}$$

$\dfrac{x(4w+x)}{w^2x^2} + \dfrac{w(5w-2x)}{w^2x^2}$

$\dfrac{4wx + x^2 + 5w^2 - 2wx}{w^2x^2} = \dfrac{2wx + x^2 + 5w^2}{w^2x^2}$

7. Solve for the missing variable. (1pts) $a - \dfrac{7}{12} = -\dfrac{5}{8}$
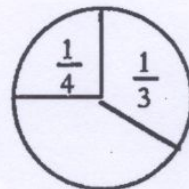
$a = \dfrac{-5}{8} + \dfrac{7}{12}$ $a = \dfrac{-15}{24} + \dfrac{14}{24}$ $\boxed{a = \dfrac{-1}{24}}$

8. Determine the unlabeled fraction of the whole (1pts)

$\dfrac{1}{4} + \dfrac{1}{3} = \dfrac{3}{12} + \dfrac{4}{12} = \dfrac{7}{12}$

Unlabeled fraction $\dfrac{12}{12} - \dfrac{7}{12} = \boxed{\dfrac{5}{12}}$

9. A rectangle is 22 cm long and 20 cm wide. Three quarters of its length and two-thirds of its width are cut off. What fraction of the area of the original rectangle remains? (2pts)

Original Area → $22 \times 20 =$ <u>440 cm²</u>

New Area $5\frac{1}{2} \times 6\frac{2}{3}$

$\frac{11}{2} \times \frac{20}{3} = \frac{110}{3} = 36\frac{2}{3}$ cm²

$36\frac{2}{3}x = 440$

$x = 440 \div 36\frac{2}{3}$

$x = 12$

Answer $= \frac{1}{12}$

10. Hana wants to put new speakers in her car. It takes at least $4\frac{2}{7}$ ft of speaker wire to connect each speaker to her car stereo. She found 41 feet of speaker wire in her trunk. How many speakers can she connect with this wire *and* how much wire will be left over? (2pts)

$41 \div 4\frac{2}{7}$

$\frac{41}{1} \div \frac{30}{7} = \frac{41}{1} \times \frac{7}{30} = \frac{287}{30} = 9\frac{17}{30}$

She can connect 9 speakers. $2\frac{3}{7}$ ft of wire will be left over.

11. A ball is dropped from a height of 120 cm and always bounces upwards $\frac{2}{3}$ of the height from which it falls. How high does the ball go between the third and fourth bounces? Express your answer to the nearest whole number. (2pts)

Between 1st & 2nd bounces the ball goes. $\frac{120}{1} \times \frac{2}{3} = 80$ cm high.

Between 2nd & 3rd $80 \times \frac{2}{3} = 53\frac{1}{3}$ cm high.

Between 3rd & 4th $53\frac{1}{3} \times \frac{2}{3} = 35\frac{7}{9} \approx$ | 36 cm to the nearest whole number.

12. Simplify (2pts)

$\frac{6x^2}{5} \cdot \frac{8x^2y}{27} \cdot \frac{5y^2}{18} = \frac{8x^4y^3}{405}$

13. Solve the following equations for x. (2pts)

a) $\frac{5x}{6} - \frac{3}{8} = \frac{7x+5}{12}$

$\frac{5x}{6}^{\times 4} - \frac{7x+5}{12}^{\times 2} = \frac{3}{8}^{\times 3}$

$\frac{\times 24}{1}\left(\frac{20x}{24} - \frac{14x+10}{24}\right) = \left(\frac{9}{24}\right)^{\times \frac{24}{1}}$

$20x - (14x+10) = 9$

$20x - 14x - 10 = 9$

$6x = 9 + 10$

$6x = 19$

$x = \frac{19}{6}$

$x = 3\frac{1}{6}$

b) Two thirds of a number is $3\frac{1}{2}$ more than three eighths of the number. Find the number.
(2pts)

$$\frac{2}{3}n = \frac{3}{8}n + 3\frac{1}{2}$$

$$\frac{2}{3}n - \frac{3}{8}n = 3\frac{1}{2}$$

$$\frac{16}{24}n - \frac{9}{24}n = 3\frac{1}{2}$$

$$\frac{7}{24}n = 3\frac{1}{2}$$

$$7n = \frac{7}{2} \times \frac{24}{1}$$

$$7n = 84$$

$$n = 84 \div 7$$

$$\boxed{n = 12}$$

14. Jin Young saves 20% of his income each week. $\frac{3}{5}$ of his expenditure is spent on food, $\frac{1}{8}$ of it is spent on bills and $\frac{2}{3}$ of the remainder is spent on entertainment. If he spends $94 on food and entertainment altogether, how much does he save each week? (3pts)

$$\frac{3}{5} + \frac{1}{8} = \frac{24}{40} + \frac{5}{40} = \frac{29}{40}$$

$$\frac{3}{5} + \frac{11}{60} = \frac{36}{60} + \frac{11}{60} = \frac{47}{60}$$

(20%)

$.2$ of 150

$30

He saves $30 per week.

remainder of expenditure: $\frac{11}{40}$

$$\frac{2}{3} \text{ of } \frac{11}{40} = \frac{11}{60} \to \text{entertainment}.$$

x = total expenditures

$$\frac{47}{60} x = 94$$

$$x = 94 \div \frac{47}{60}$$

$$x = \frac{94}{1} \times \frac{60}{47} = \$120$$

Expenditures = $120

$$120 = .8x$$

$$x = 120 \div .8$$

$$x = \$150 \to \text{Total Income}.$$

15. Unusual Age. My age is a multiple of 7. Next year, it will be a multiple of 5. When will this event occur again? (2pts)

Mult. of 7	7	14	21	28	35	42	49	56	63	84
In 1 year	8	15	22	29	36	43	50	57	64...	85

Now

In 35 years.