

1.) $(3^1 a^2 | b^5)$ ⁴

$$\boxed{3^4 a^8 | b^{20}}$$

$$\boxed{8 | a^8 | b^{20}}$$

2.) $(4^1 x^5 | y^7)$ ³

$$\boxed{4^3 x^{15} | y^{21}}$$

$$3^3 z^{15}$$

Pre-Algebra Chapter 5 Pre-Test

1.) (5 pts each, 10 pts total) (2-1) Find the lowest common denominator (LCD) of each pair of fractions. Write equivalent fractions using the LCD and compare. Use $>$, $<$, or $=$ to compare each statement.

a) $\frac{23}{36}$ and $\frac{4}{6}$

Handwritten work for (a):

- Original fractions: $\frac{23}{36}$ and $\frac{4}{6}$. Above 36 is written 23×6 and above 6 is written $36 \div 4$.
- Equivalent fractions: $\frac{138}{36}$ and $\frac{144}{36}$. A large red 'X' is drawn over these fractions.
- Comparison: $138 < 144$.
- Alternative equivalent fractions: $\frac{23}{36} = \frac{23}{36}$ and $\frac{4}{6} = \frac{24}{36}$.
- Comparison: $\frac{23}{36} < \frac{24}{36}$.

b) $\frac{3}{8}$ and $\frac{8}{12}$

2.) (5 pts) (2-2) Write the decimal as a fraction.

Handwritten work for (2.):

- Given decimal: $n = 0.633333\ldots$
- Step 1: Get version decimal is after the first repeat. $100n = 63.\overline{3333} \dots$
- Step 2: Get version decimal is before the first repeat. $10n = 6.\overline{3333} \dots$
- Subtraction: $100n - 10n = 63.\overline{3333} - 6.\overline{3333} = 57$
- Equation: $\frac{90n}{90} = \frac{57}{90}$
- Simplification: $n = \frac{57 \div 3}{90 \div 3} = \frac{19}{30}$

3.) (5 pts each, 10 points total) Convert as required.

a) Write $0.\underline{65}$ as a fraction.

Handwritten work for (3a):

$$\frac{65 \div 5}{100 \div 5} = \frac{13}{20}$$

b) Write $\frac{3}{8}$ as a decimal.

Handwritten work for (3b):

- Long division: $8 \overline{) 3.000}$
- Steps: $3.000 - 24 = 60$; $60 - 56 = 40$; $40 - 40 = 0$
- Result: $\frac{3}{8} \Rightarrow 0.375$

4.) (5 pts each, 10 pts total) (5-3) Find each difference. Reduce if needed.

a) $\frac{2}{3} - \frac{9}{15}$

b) $8\frac{1}{3} - 3\frac{5}{6}$

$$\begin{array}{r}
 8\frac{1}{3} \\
 3\frac{5}{6} \\
 \hline
 7\frac{2}{6} + \frac{6}{6} \\
 - 3\frac{5}{6} \\
 \hline
 4\frac{3}{6} = 4\frac{1}{2}
 \end{array}$$

Handwritten notes: $\frac{1}{3} = \frac{2}{6}$, $\frac{5}{6} = \frac{5}{6}$, $\frac{2}{6} + \frac{6}{6}$

5.) (5 pts each, 10 pts total) (5-3) Find each sum. Write as either an improper fraction or mixed number. Reduce if needed.

a) $\frac{5}{6} + \frac{4}{9}$

b) $7\frac{5}{12} + 2\frac{7}{16}$

Handwritten notes: 12, 24, 36, 48, 60; 16, 32, 48, 64, 80

$$\begin{array}{r}
 7\frac{5}{12} \\
 + 2\frac{7}{16} \\
 \hline
 7\frac{20}{48} \\
 + 2\frac{21}{48} \\
 \hline
 9\frac{41}{48}
 \end{array}$$

Handwritten notes: $\frac{5}{12} = \frac{20}{48}$, $\frac{7}{16} = \frac{21}{48}$

6.) (5 pts each, 10 pts total) (5-4) Find the product.

a) $4\frac{1}{3} \times \frac{9}{2}$ $4\frac{1}{3} = \frac{(4 \times 3) + 1}{3} = \frac{13}{3}$

$\frac{13}{3} \times \frac{9}{2}$ $\frac{9}{3} \div 3$

$\frac{13}{1} \times \frac{3}{2} = \boxed{\frac{39}{2}}$

b) $\frac{4}{7} \times \frac{14}{16}$

7.) (5 pts each, 10 pts total) (5-4) Find the quotient.

a) $5\frac{1}{4} \div \frac{7}{8}$ $5\frac{1}{4} = \frac{(5 \times 4) + 1}{4} = \frac{21}{4}$

$\frac{21}{4} \div \frac{7}{8}$ *Keep Change Flip!*

$\frac{21}{4} \times \frac{8}{7}$ $\frac{21}{1} \times \frac{2}{7 \div 7}$

$\frac{3}{1} \times \frac{2}{1} = \frac{6}{1} = \boxed{6}$

b) $\frac{11}{12} \div \frac{2}{3}$

8.) (5 pts each, 15 points total) (5-7) Solve each equation.

a) $x + \frac{3}{4} = \frac{7}{12}$ $x = \frac{7}{12} - \frac{3}{4}$

$-\frac{3}{4}$ $-\frac{3}{4}$

$\frac{7}{12} = \frac{7}{12}$ $x = \frac{7}{12} - \frac{9}{12}$

$\frac{3}{4} \xrightarrow{\cdot 3} \frac{9}{12}$ $-\frac{2 \div 2}{12 \div 2} = \frac{-1}{6}$

$\xrightarrow{\cdot 3}$

b) $y - \frac{1}{7} = \frac{3}{5}$

c) $z - 5\frac{1}{2} = 6\frac{7}{10}$

9.) (5 pts each, 10 points total) (5-8) Solve each equation.

a) $\frac{-8}{3}x = 2\frac{4}{6}$ $2\frac{4}{6} = \frac{(2 \cdot 6) + 4}{6} + \frac{16}{6}$

$-\frac{3}{8} * \frac{-8}{3}x = \frac{16}{6} * \frac{-3}{8}$

$x = \frac{16}{6} * \frac{-3 \div 3}{8} = \frac{16 \div 8}{2} * \frac{-1}{8 \div 8}$

$\frac{2 \div 2}{2} * \frac{-1}{1} = \frac{1}{1} * \frac{-1}{1} = \boxed{-1}$

b) $7\frac{9}{13}x = \frac{1}{8}$

10.) (5 pts each, 10 points total) (5-9) Simplify each expression.

a) $\left(\frac{a^3 b^5}{c^2}\right)^3$

$$\frac{a^9 b^{15}}{c^6}$$

b) $\left(\frac{x^4 y^6}{2z^2}\right)^4$