Mathematics9 Date _____

Unit 1: Review – Integers & Rationals [NO CALCULATORS]

1.5 Rationals: Multiplication & Division

- Do **NOT** need a common denominator to multiply or divide
- Can **NOT** easily multiply or divide in mixed number form – change to impropers

Multiplication

- Cancel (divide) common factors from numerator/denominator pairs and then multiply straight across

Ex. Evaluate:

a) $\frac{2}{3} \times \frac{1}{4}$

$= \frac{1}{6}$

b) $\frac{5}{12} \times \frac{9}{20}$

$= \frac{3}{16}$

c) $\frac{3}{4} \times \frac{16}{1}$

$= \frac{12}{1}$

$= 12$

Ex. Evaluate:

a) $2\frac{1}{2} \times \frac{3}{4}$

$= \frac{5}{2} \times \frac{3}{4}$

$= \frac{15}{8}$

$= 1\frac{7}{8}$

b) $2 \times 3\frac{3}{4}$

$= \frac{2}{1} \times \frac{15}{4}$

$= \frac{15}{2}$

$= 7\frac{1}{2}$

c) $5\frac{1}{3} \times 2\frac{1}{10}$

$= \frac{16}{3} \times \frac{21}{10}$

$= \frac{56}{5}$

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

Reciprocals

- The reciprocal of a fraction switches the numerator & denominator "flip" the fraction

Ex. State the reciprocal of each:

a) $\frac{2}{3}$

$\frac{3}{2}$

b) $\frac{1}{5}$

$\frac{5}{1} = 5$

c) $\frac{6}{1}$

$\frac{1}{6}$

Division

- Change division to multiplication by the reciprocal

* reciprocal of the divisor (after the ÷)

Ex. Evaluate:

a) $\frac{3}{4} \div \frac{5}{2}$

$= \frac{3}{2\cancel{4}} \times \frac{\cancel{2}^{1}}{5}$

$= \boxed{\frac{3}{10}}$

b) $3\frac{1}{2} \div 5\frac{1}{4}$

$= \frac{7}{2} \div \frac{21}{4}$

$= \frac{\cancel{7}^{1}}{\cancel{2}_{1}} \times \frac{\cancel{4}^{2}}{\cancel{21}_{3}}$

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

c) $5 \div 3\frac{1}{3}$

$= \frac{5}{1} \div \frac{10}{3}$

$= \frac{\cancel{5}^{1}}{1} \times \frac{3}{\cancel{10}_{2}}$

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

Practice: Worksheets – on sheet or separate; show pre-cancelling when ×; show change to × reciprocal when ÷