5.2 Proportions p. 7 12/6

E.Q: How can we tell when two ratios are proportional? (form a proportion) (similar to equivalent fractions)

*proportion: two ratios that are equivalent.

ex: $\frac{1}{2}=\frac{3}{6}$ $\frac{4}{7}=\frac{16}{28}$

* How can we tell when 2 ratios are proportional.

① Both ratios SIMPLIFY to the same #.

$\frac{3}{9}\div\frac{3}{3}=\frac{1}{3}$ $\frac{8}{24}\div\frac{8}{8}=\frac{1}{3}$

The ratios are proportional because they simply to the same #.

② Multiply by the SAME #:

$\frac{\text{Top}}{\text{bottom}}=\frac{\text{Top}}{\text{bottom}}$: $\frac{3}{5}=\frac{18}{30}$ (×6)

$\frac{\text{Top}}{\text{Bottom}}=\frac{\text{Top}}{\text{Bottom}}$ $\frac{5}{15}=\frac{7}{21}$ (×3)

Must go the SAME DIRECTION both times.

③ Same UNIT RATE

$\frac{\$3.20}{4\text{ cookies}}=\frac{\$4.00}{5\text{ cookies}}$

$4\overline{)3.20}$ → $\$.80$

$5\overline{)4.00}$ → $\$.80$

Unit Rate

$\frac{\$.80}{1\text{ cookies}}$ $\frac{\$.80}{1\text{ cookie}}$

$.80/cookie

The ratios are proportional because their UNIT RATES are same.

④ Cross Products are Equal

$\frac{4.5}{13.5}\times\frac{6.7}{20.1}$ Cross Multiply

$4.5(20.1)=13.5(6.7)$

$90.45=90.45$

The ratios are proportional because their CROSS PRODUCTS