Multiplication and Division with Integers

In order to multiply mixed numbers one must change mixed numbers into <u>improper fractions</u>.

Ex 1 $-3\frac{1}{2} \cdot -2\frac{1}{7} \div 2\frac{1}{2} \cdot -1\frac{1}{3}$

: Turn all mixed numbers into improper fractions

$\frac{-7}{2} \cdot \frac{-15}{7} \div \frac{5}{2} \cdot \frac{-4}{3}$

$\frac{-7}{2} \cdot \frac{-15}{7} \cdot \frac{2}{5} \cdot \frac{-4}{3}$

: Take reciprocals for any divisors

$\frac{\cancel{-7}^{1}}{\cancel{2}_{1}} \cdot \frac{\cancel{-15}^{3}}{\cancel{7}_{1}} \cdot \frac{\cancel{2}^{1}}{\cancel{5}_{1}} \cdot \frac{-4}{\cancel{3}_{1}}$

: Look for opportunities to cancel or reduce <u>numerators</u> vs <u>denominators</u>

$\frac{-4}{1}$

: Multiply and reduce

-4

Ex 2 $2\frac{1}{2} \cdot \left(-2\frac{2}{3}\right) \div \left(-4\frac{1}{4}\right) \cdot \left(-3\frac{2}{5}\right)$

$\frac{5}{2} \cdot \frac{-8}{3} \div \frac{-17}{4} \cdot \frac{-17}{5}$: TURN ALL MIXED NUMBERS INTO IMPROPER FRACTIONS

$\frac{5}{2} \cdot \frac{-8}{3} \cdot \frac{-4}{17} \cdot \frac{-17}{5}$: TAKE RECIPROCAL OF ANY DIVISORS

$\frac{5^{1}}{2_{1}} \cdot \frac{-8}{3} \cdot \frac{-\cancel{4}^{2}}{\cancel{17}_{1}} \cdot \frac{-\cancel{17}^{1}}{\cancel{5}_{1}}$

$\frac{-16}{3}$: LOOK FOR OPPORTUNITIES TO CANCEL OR REDUCE

$-5\,1/3$: TURN IMPROPER FRACTION INTO MIXED NUMBER

Ex 3 $-5\frac{1}{2} \div 3\frac{2}{3} \cdot -4\frac{1}{2} \cdot \frac{2}{3}$

$-\frac{11}{2} \div \frac{11}{3} \cdot \frac{-9}{2} \cdot \frac{2}{3}$: TURN ALL MIXED NUMBERS INTO IMPROPER FRACTIONS

$-\frac{11}{2} \cdot \frac{3}{11} \cdot \frac{-9}{2} \cdot \frac{2}{3}$: TAKE RECIPROCAL OF ANY DIVISORS

$\frac{-\cancel{11}^{1} \cdot \cancel{3}^{1} \cdot -9 \cdot \cancel{2}^{1}}{\cancel{2}_{1} \cdot \cancel{11}_{1} \cdot 2 \cdot \cancel{3}_{1}}$

$\frac{9}{2}$: REDUCE

$4\,1/2$