M2T2 Notes: Properties Make the Math Easier!

Commutative Property (regroup): $a + b = b + a$ or $a \cdot b = b \cdot a$

1a) $-8 + 17 + (-2) + 3$

$-8 + (-2) + 17 + 3$

$-10 + 20$

$\boxed{10}$

1b) $-15 + 26 + (-5) + 4$

$-15 + (-5) + 26 + 4$

$-20 + 30$

$\boxed{10}$

2a) $-4 \cdot 7 \cdot 5$

$-4 \cdot 5 \cdot 7$

$-20 \cdot 7$

$\boxed{-140}$

2b) $(5)(-17)(-2)$

$(5)(-2)(-17)$

$(-10)(-17)$

$\boxed{170}$

3a) $\frac{3}{4} + \frac{-5}{3} + \frac{5}{4}$

$\frac{3}{4} + \frac{5}{4} + \frac{-5}{3}$

$\frac{8}{4} + \frac{-5}{3}$ $\quad 2 + -1\frac{2}{3}$

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

3b) $\frac{2}{3} \cdot \frac{-5}{8} \cdot \frac{3}{4}$

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

$\frac{1}{2} \cdot \frac{-5}{8}$

$\boxed{\frac{-5}{16}}$

Associative Property (reorder): $a + (b + c) = (a + b) + c$ or $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

(parentheses shift around different numbers, but the numbers stay in the same order)

4a) $(-8 + 27) + 13$

$-8 + (27 + 13)$

$-8 + 40$

$\boxed{32}$

4b) $-46 + (-4 + 19)$

$(-46 + -4) + 19$

$-50 + 19$

$\boxed{-31}$

4c) $1\frac{2}{3} + (-4\frac{2}{3} + 1\frac{1}{2})$

$(1\frac{2}{3} + -4\frac{2}{3}) + 1\frac{1}{2}$

$-3 + 1\frac{1}{2}$

$\boxed{-1\frac{1}{2}}$

5a) $-5 \cdot (4 \cdot 13)$

$(-5 \cdot 4) \cdot 13$

$-20 \cdot 13$

$\boxed{-260}$

5b) $(-3 \cdot 8) \cdot 5$

$-3 \cdot (8 \cdot 5)$

$-3 \cdot 40$

$\boxed{-120}$

5c) $\frac{3}{5}(\frac{5}{9} \cdot \frac{-1}{2})$

$(\frac{\cancel{3}^{1}}{\cancel{5}_{1}} \cdot \frac{\cancel{5}^{1}}{\cancel{9}_{3}}) \cdot \frac{-1}{2}$

$\frac{1}{3} \cdot \frac{-1}{2}$

$\boxed{\frac{-1}{6}}$

Sometimes other properties also show up:

6a) $\frac{3}{4} \cdot \frac{-5}{3} \cdot \frac{4}{3}$

$(\frac{\cancel{3}}{\cancel{4}} \cdot \frac{\cancel{4}^{1}}{\cancel{3}}) \cdot \frac{-5}{3}$

$\boxed{\frac{-5}{3}}$

6b) $\frac{3}{4} + (\frac{-3}{4} + \frac{4}{3})$

$(\frac{3}{4} + \frac{-3}{4}) + \frac{4}{3}$

$0 + \frac{4}{3}$

$\boxed{\frac{4}{3}}$