Problem of the Week

Problem B and Solution

Maybe Equals, Maybe Not

Problem

(a) For each of the following statements, fill in the $\bigcirc$ with $=$, $<$, or $>$ to make the statement true.

(i) $0.5 + 0.24 \bigcirc \frac{3}{4}$

(ii) $1.10 + \frac{1}{4} \bigcirc \frac{35}{100}$

(iii) $2 \times 2 \times 5 \bigcirc \frac{100}{5}$

(iv) $100 - 24 + 65 \bigcirc 14 \times 10$

(v) $25 \times 40 + 321 \bigcirc 153 \times 10$

(vi) $2 \times 24 \div 6 \bigcirc \frac{36}{6}$

(vii) $35 \times 2 \bigcirc 5 \times 14$

(viii) $2y + 6 \bigcirc y + 3 + y + 3$

(b) In the following statement, determine values of y that make the statement true when the $\bigcirc$ is replaced with $=$, $<$, and $>$.

$$4y + 12 \bigcirc 4 + 2y + 4 + 3y + 4$$

Solution

(a) To determine which symbol we should put in the $\bigcirc$, we look at the left side and right side of each statement separately.

(i)

Left Side	**Right Side**
$0.5 + 24$	$\frac{3}{4}$
$= 0.74$	$= 0.75$

Since $0.74 < 0.75$, then $0.5 + 0.24 < \frac{3}{4}$.

(ii)

Left Side	**Right Side**
$1.10 + \frac{1}{4}$	$\frac{35}{100}$
$= 1.10 + 0.25 = 1.35$	$= 0.35$

Since $1.35 > 0.35$, then $1.10 + \frac{1}{4} > \frac{35}{100}$.

(iii)

Left Side	**Right Side**
$2 \times 2 \times 5$	$\frac{100}{5}$
$= 4 \times 5 = 20$	$= 20$

Since $20 = 20$, then $2 \times 2 \times 5 = \frac{100}{5}$.

(iv)

Left Side	**Right Side**
$100 - 24 + 65$	14×10
$= 76 + 65 = 141$	$= 140$

Since $141 > 140$, then $100 - 24 + 65 > 14 \times 10$.

(v)

Left Side	**Right Side**
$25 \times 40 + 321$	153×10
$= 1000 + 321 = 1321$	$= 1530$

Since $1321 < 1530$, then $25 \times 40 + 321 < 153 \times 10$.

(vi)

Left Side	**Right Side**
$2 \times 24 \div 6$	$\frac{36}{6}$
$= 48 \div 6 = 8$	$= 6$

Since $8 > 6$, then $2 \times 24 \div 6 > \frac{36}{6}$.

(vii)

Left Side	**Right Side**
35×2	5×14
$= 70$	$= 70$

Since $70 = 70$, then $35 \times 2 = 5 \times 14$.

(viii)

Left Side	**Right Side**
$2y + 6$	$y + 3 + y + 3$
	$= y+y+3+3 = 2y+6$

Since $2y + 6 = 2y + 6$ for any value of y, then $2y + 6 = y + 3 + y + 3$.

(b) The right side can be rewritten as $4 + 2y + 4 + 3y + 4 = 2y + 3y + 4 + 4 + 4 = 5y + 12$. Then our statement becomes $4y + 12 \bigcirc 5y + 12$.

If y is any value greater than 0, such as 1, then $4y + 12 < 5y + 12$. If $y = 0$, then $4y + 12 = 5y + 12$. If y is any value less than 0, such as -1, then $4y + 12 > 5y + 12$.