MTH 60 group work
Monday, 1/5/2015

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Work the following problems paying careful attention to formatting. Always start by writing the original problem to the left of the first equal sign. Simplifications belong to the right of the equal signs. If you have more than one simplification step, remember to line up your equal signs. One person from each group will hand in the work. Compare your answers and decide who will turn in this assignment for the group. Make sure each group member's name is on the sheet to be turned in! You must work as a group to earn credit. No individual submissions.

1. Evaluate $5+3z$ for $z=6$. Start with the given expression and line up your equal signs.

If $z=6$, then $5+3z = 5+3(6)$
$= 5+18$
$= 23$

2. Evaluate $\frac{2y-x+24}{2x-y}$ for $x=7$ and $y=5$. Start with the given expression and line up your equal signs.

If $x=7$ and $y=5$, then $\frac{2y-x+24}{2x-y} = \frac{2(5)-7+24}{2(7)-5}$

$= \frac{10-7+24}{14-5}$

$= \frac{3+24}{9}$

$= \frac{27}{9}$

$= 3$

3. Write each English phrase as an algebraic expression. Use a different variable for each expression, defining each variable. Do not use the variable x.

a. six more than a number

Let n represent the number.

$n+6$

b. three subtracted from a number

Let N represent the number

$N-3$

c. three decreased by a number

Let m represent the number

$3-m$

d. five times a number, decreased by 7

Let a represent the number.

$5a-7$

e. four less than the product of 9 and a number

Let b represent the number.

$9b-4$

f. the sum of 20 divided by a number and that number divided by 20

Let c represent the number.

$\frac{20}{c}+\frac{c}{20}$

g. four more than the quotient of 30 and a number

Let d represent the number

$\frac{30}{d}+4$

4. Determine whether 30 is a solution to the equation $50 - b = 20$.

$50-b=20$
$50-30=20$
$20=20$

30 is a solution.

5. Determine whether 6 is a solution to the equation $3m + 4 = 19$.

$3m+4=19$
$3(6)+4=19$
$18+4=19$
$22=19$

6 is not a solution.

6. Determine whether 6 is a solution to the equation $4(p+3) = 6p$.

$4(p+3)=6p$
$4(6+3)=6(6)$
$4(9)=36$
$36=36$

6 is a solution.

7. Write each sentence as an equation. Use a different variable for each equation, defining each variable. Do not use the variable x.

a. Five times a number is 35.

Let a represent the number.

$5a = 35$

b. The quotient of a number and 8 is $\frac{1}{4}$.

Let b represent the number.

$\frac{b}{8} = \frac{1}{4}$

c. The sum of twice a number and 7 is 23.

Let c represent the number.

$2c + 7 = 23$

d. The product of 6 and a number, increased by 3, is 33.

Let d represent the number.

$6d + 3 = 33$

e. The product of 6 and a number increased by 3 is 33.

Let n represent the number.

$6(n+3) = 33$

8. Write $8\frac{3}{5}$ as an improper fraction.

$8\frac{3}{5} = \frac{8 \cdot 5 + 3}{5}$

$= \frac{43}{5}$

9. Write $\frac{20}{3}$ as a mixed number.

$3\overline{)20}$ 6 R 2

18

2

$\frac{20}{3} = 6\frac{2}{3}$

10. Is 110 prime or composite? If it is composite, find its prime factorization.

110 is composite

$110 = 2 \cdot 5 \cdot 11$

110 → 2, 55 → 5, 11

11. Simplify $\frac{116}{86}$ by reducing it to its lowest terms. Show your work properly. Start with the given fraction to the left of the first equal sign. Show the factorizations and reducing common factors. Line up your equal signs.

$$\frac{116}{86} = \frac{2 \cdot 2 \cdot 29}{2 \cdot 43}$$

$$= \frac{2}{2} \cdot \frac{2 \cdot 29}{43}$$

$$= 1 \cdot \frac{58}{43}$$

$$= \frac{58}{43}$$

116 → 2, 58 → 2, 29

86 → 2, 43

12. Perform the indicated operations. Where possible, reduce to lowest terms. Show your work properly, starting with the given fraction and lining up your equal signs.

a. $\left(2\frac{4}{5}\right)\left(1\frac{1}{4}\right)$

$$\left(2\tfrac{4}{5}\right)\left(1\tfrac{1}{4}\right) = \left(\tfrac{14}{5}\right)\left(\tfrac{5}{4}\right)$$

$$= \frac{14 \cdot 5}{5 \cdot 4}$$

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

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

b. $\frac{7}{4} \div \frac{3}{8}$

$$= \frac{7}{4} \cdot \frac{8}{3}$$

$$= \frac{7 \cdot 8}{4 \cdot 3}$$

$$= \frac{7 \cdot 4 \cdot 2}{4 \cdot 3}$$

$$= \frac{14}{3}$$

13. Perform the indicated operations. Where possible, reduce to lowest terms. Show your work properly, starting with the given fraction and lining up your equal signs.

a. $\frac{9}{16}-\frac{5}{16}$

$= \frac{4}{16}$

$= \frac{4 \cdot 1}{4 \cdot 4}$

$= \frac{1}{4}$

b. $\frac{2}{5}+\frac{2}{15}$

$= \frac{2}{5} \cdot \frac{3}{3} + \frac{2}{15}$

$= \frac{6}{15} + \frac{2}{15}$

$= \frac{8}{15}$

14. Determine whether $2\frac{2}{3}$ is a solution to $(y \div 6)+\frac{1}{3}=(y \div 2)-\frac{5}{9}$.

$2\frac{2}{3} = \frac{8}{3}$

$(y \div 6) + \frac{1}{3} = (y \div 2) - \frac{5}{9}$

$\left(\frac{8}{3} \div \frac{6}{1}\right) + \frac{1}{3} = \left(\frac{8}{3} \div \frac{2}{1}\right) - \frac{5}{9}$

$\frac{8}{3} \cdot \frac{1}{6} + \frac{1}{3} = \frac{8}{3} \cdot \frac{1}{2} - \frac{5}{9}$

$\frac{2 \cdot 4}{3 \cdot 2 \cdot 3} + \frac{1}{3} = \frac{2 \cdot 4}{3 \cdot 2} - \frac{5}{9}$

$\frac{4}{9} + \frac{1}{3} \cdot \frac{3}{3} = \frac{4}{3} \cdot \frac{3}{3} - \frac{5}{9}$

$\frac{4}{9} + \frac{3}{9} = \frac{12}{9} - \frac{5}{9}$

$\frac{7}{9} = \frac{7}{9}$

$2\frac{2}{3}$ is a solution.