Fifth Set of Homework for Math 05

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Please note: You should fully justify your answers.

1 Solving Linear equations

1. Solve each of the following linear equations.
   (a) $-4x + 20 = 6x$ $x = 2$
   (b) $2x - 7 = 5x + 8$ $x = -5$
   (c) $5 - 4x = 7x - 5$ $x = \frac{10}{11}$
   (d) $7x - 3 = 2x - 3$ $x = 0$
   (e) $-2x + \frac{5}{2} = 5x - 1$ $x = \frac{1}{2}$
   (f) $9 + x = -3x + 7$ $x = -\frac{1}{2}$
   (g) $\frac{2}{3}x - 4 = 5x + \frac{7}{2}$ $x = -\frac{45}{26}$
   (h) $2(x + 5) = 12$ $x = 1$
   (i) $3(5 - 2x) = 4x - 7$ $x = \frac{11}{5}$
   (j) $4(-3x + 1) + 2 = -12x + 6$ All real numbers
   (k) $2(5x + 10) - 3x = -2(x + 8)$ $x = -4$
   (l) $-5(-2x + 6) + 9 = -3(x + 11) + 13x$ No solution
   (m) $-4(3x - 6) + 2x = 5(x + 1) - 11$ $x = 2$
   (n) $3(-5x + 8) - 3 = 2(x - 5) - 17x + 11$ No solution
   (o) $2(x - 5) + 3x - 10 = 3(-2x + 4) + 4x + 3$ $x = 5$
   (p) $\frac{2x - 3}{4} + \frac{x}{3} = \frac{1}{6}$ $\frac{11}{10}$
   (q) $\frac{x - 4}{5} - 3 = 4x$ $x = -1$
   (r) $\frac{3x - 6}{5} - 7x = \frac{7x + 1}{5} - 17$ $x = 2$
   (s) $\frac{2x - 3}{5} + 2x = -\frac{2 - x}{4} - 3$ $x = -\frac{58}{43}$
   (t) $\frac{4 - x}{5} + 3x + 2 = \frac{5x - 3}{3} + 2x + 12$ $x = -6$
2. Find the real numbers a for which the following equation is an identity:

$$2(7x + 3) - 2a = 4(3x - 3) + 2x - 6$$

   $a = 12$
3. Find the real numbers a for which the following equation (in x) has no solutions.

$$3(2x - 5) = 6x + a$$

Answer. All real numbers a with $a \neq -15$. □

4. Find a and b if the following equation is an identity:

$$2(ax - 5) - 3 = 7x + b$$

$a = \frac{7}{2}, b = -13$