Solve these equations.

a $6a + 3 = 2a - 5$ b $5m + 3 = 2m + 10$ c $4x - 5 = 2 - x$

d $3y + 6 = 5 - 2y$ e $8 + 5t = 3t - 2$ f $6x = 2x - 20$

g $12x - 9 = x + 1$ h $10 - 3d = 2d + 5$ i $9t = 3t + 5$

j $5m - 3 = 9$ k $2x - 3 + 4x = 5 - x$ l $4y = 2y - 9 + 7y$

m $4a + 9 = 2a - 4$ n $12 = 5 - 6b$ o $18 - 5s = 4s + 27$

p $21 + 4x = 3x - 5 - x$ q $21 - 7g = 3 - g$ r $32 + \frac{1}{2}x = 20 - x$

s $\frac{3}{4}x - 5 = 1 - \frac{1}{4}x$ t $5 - 8y = 2y + 5$ u $12 + 4d = 5 - 3d$

Solve each equation. Use Worked Example 2(b) as a guide.

a $3(a + 2) + a + 5 = 15$ b $5(m - 1) + 2m = 2$ c $2(m + 3) + 5(m + 2) = 23$

d $3(x + 2) + 2(x - 3) = 10$ e $5(p + 1) + 2(p + 4) = 20$ f $4(t - 2) + 2(t + 5) = 14$

g $4(2a + 3) + 2(a - 5) = 22$ h $2(2m + 3) + 3(m - 5) = 5$ i $5(a - 3) + 3(2 + 3a) = 19$

Solve these equations, but first read the warning sign!

a $3(x - 2) - 5(x + 2) = 0$ b $7(2a + 3) - 3(a - 5) = 12$ c $9(2t - 3) - (t + 5) = 2$

d $5(3y - 5) - 6(1 - y) = 11$ e $4(6 - 3b) - 2(7b - 1) = 26$ f $9(3q + 7) - 6(2q + 5) = 14$

g $2(3w + 1) - 3(5 - 4w) = 4(2w + 3)$ h $17 - 6(2x - 5) = 17$

i $\frac{1}{2}(4x + 3) - 2(2x - 1) = 7$ j $\frac{3}{4}(8x - 9) - \frac{1}{4}(8x - 9) = 15$

Solve these equations which have variables on both sides.

a $\frac{3m}{2} - 4 = m$ b $\frac{3x}{7} + 1 = 2x$ c $q - 3 = \frac{2q}{3}$

d $a = \frac{3a + 4}{5}$ e $\frac{2p + 7}{3} = 2p - 3$ f $2t - 5 = \frac{6t - 1}{9}$

g $\frac{5y}{3} - 6 = \frac{4y - 5}{3}$ h $\frac{1}{4}(3x - 11) = 2x + 1$

i $\frac{5 - 4d}{6} = d + 5$ j $1 - y = \frac{7 - 9y}{6}$

I Solve the following equations. All solutions are integers. You should check all solutions by substituting your solution into the equation.

a $\frac{x}{2} + \frac{x}{3} = 5$ b $\frac{p}{6} + \frac{p}{2} = 8$

c $\frac{m}{4} + \frac{m}{6} = 20$ d $\frac{y}{2} - \frac{y}{4} = 3$

f $\frac{x}{3} - \frac{x}{5} = 4$ g $\frac{3k}{2} + \frac{k}{4} = 14$

i $\frac{3p}{2} + \frac{p}{3} = 11$ j $\frac{x}{2} - \frac{2x}{5} = 3$

l $4a - \frac{2a}{5} = 18$ m $\frac{m}{4} = \frac{m}{3} - 2$

o $\frac{x}{2} + \frac{x}{10} = \frac{2x}{5} + 4$ p $\frac{b + 4}{2} = \frac{b + 10}{3}$

q $\frac{m + 6}{3} = \frac{2m + 4}{4}$ r $\frac{k - 1}{4} = \frac{k - 5}{2}$