Solving Equations

Emphasis on Multi-Step Linear Equations

Solve each of the following.

1. $p + 2p - 3 = 6$

$3p - 3 = 6$
$+3 \quad +3$
$\frac{3p}{3} = \frac{9}{3}$
$p = 3$

2. $12v + 14 + 10v = 80$

$22v + 14 = 80$
$-14 \quad -14$
$\frac{22v}{22} = \frac{66}{22}$
$v = 3$

3. $11w - 9 - 7w = 15$

$4w - 9 = 15$
$+9 \quad +9$
$\frac{4w}{4} = \frac{24}{4}$
$w = 6$

4. $5a + 3 - 3a = -7$

$2a + 3 = -7$
$-3 \quad -3$
$\frac{2a}{2} = \frac{-10}{2}$
$a = -5$

5. $6c - 8 - 2c = -16$

$4c - 8 = -16$
$+8 \quad +8$
$\frac{4c}{4} = \frac{-8}{4}$
$c = -2$

6. $9 = 7z - 13z - 21$

$9 = -6z - 21$
$+21 \quad +21$
$\frac{30}{-6} = \frac{-6z}{-6}$
$z = -5$

7. $-2 = 3y - 18 - 5y$

$-2 = -2y - 18$
$+18 \quad +18$
$\frac{16}{-2} = \frac{-2y}{-2}$
$y = -8$

8. $23 = -4m + 2 + m$

$23 = -3m + 2$
$-2 \quad -2$
$\frac{21}{-3} = \frac{-3m}{-3}$
$m = -7$

9. $3 + 4(z + 5) = 31$

$3 + 4z + 20 = 31$
$23 + 4z = 31$
$-23 \quad -23$
$\frac{4z}{4} = \frac{8}{4}$
$z = 2$

10. $14 + 2(4g - 3) = 40$

$14 + 8g - 6 = 40$
$8 + 8g = 40$
$-8 \quad -8$
$\frac{8g}{8} = \frac{32}{8}$
$g = 4$

11. $5m + 2(m+1) = 23$

$5m + 2m + 2 = 23$

$7m + 2 = 23$

$-2 \quad -2$

$\frac{7m}{7} = \frac{21}{7}$

$m = 3$

12. $5h + 2(11 - h) = -5$

$5h + 22 - 2h = -5$

$3h + 22 = -5$

$-22 \quad -22$

$\frac{3h}{3} = \frac{-27}{3}$

$h = -9$

13. $27 = 3c - 3(6 - 2c)$

$27 = 3c - 18 + 6c$

$27 = 9c - 18$

$+18 \quad +18$

$\frac{45}{9} = \frac{9c}{9}$

$c = 5$

14. $-3 = 142y - 5(2y - 7)$

$-3 = 142y - 10y + 35$

$-3 = 132y + 35$

$-35 \quad -35$

$\frac{-38}{132} = \frac{132y}{132}$

$y = \frac{-19}{66}$

15. $7v - (6 - 2v) = 12$

$7v - 6 + 2v = 12$

$9v - 6 = 12$

$+6 \quad +6$

$\frac{9v}{9} = \frac{18}{9}$

$v = 2$

16. $\frac{1}{3}(d + 3) = 5$

$\frac{1}{3}d + 1 = 5$

$-1 \quad -1$

$\frac{3}{1}\left[\frac{1}{3}d = 4\right]\frac{3}{1}$

$d = 12$

17. $\frac{3}{2}(x - 5) = -6$

$\frac{3}{2}x - \frac{15}{2} = -6$

$+\frac{15}{2} \quad +\frac{15}{2}$

$\frac{2}{3}\left[\frac{3}{2}x = \frac{3}{2}\right]\frac{2}{3}$

$x = 1$

18. $\frac{4}{3}(7 - n) = 12$

$\frac{3}{4}\left[\frac{4}{3}(7 - n) = 12\right]\frac{3}{4}$

$7 - n = 9$

$-7 \quad -7$

$\frac{-n}{-1} = \frac{+2}{-1}$

$n = -2$

19. $4 = \frac{2}{9}(4y - 2)$

$4 = \frac{8}{9}y - \frac{4}{9}$

$+\frac{4}{9} \quad +\frac{4}{9}$

$\frac{9}{8}\left[\frac{40}{9} = \frac{8}{9}y\right]\frac{9}{8}$

$y = 5$

20. $-32 = \frac{8}{7}(3w - 1)$

$\frac{7}{8}\left[-32 = \frac{8}{7}(3w - 1)\right]\frac{7}{8}$

$-28 = 3w - 1$

$+1 \quad +1$

$\frac{-27}{3} = \frac{3w}{3}$

$w = -9$

Alternate Method

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