3 Solving More Equations
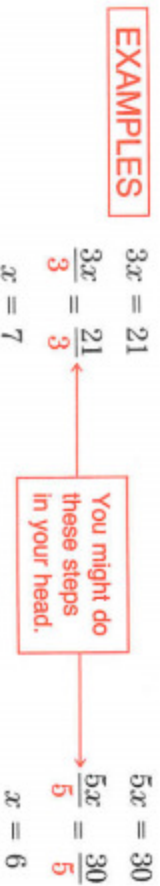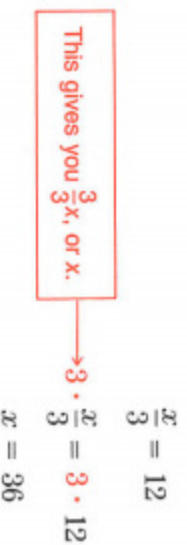
Solving a multiplication equation like $2x = 16$ should be no problem. All you do is *divide* both sides by 2.

$$2x = 16$$

This is the same as $\frac{2}{2}x$, or $1x$.

$1x = x$

$$\frac{2x}{2} = \frac{16}{2}$$

This means $16 \div 2$.

$$x = 8$$

$$3x = 21$$

$$\frac{3x}{3} = \frac{21}{3}$$

You might do these steps in your head.

$$x = 7$$

$$5x = 30$$

$$\frac{5x}{5} = \frac{30}{5}$$

$$x = 6$$

When you see a division equation like $\frac{x}{3} = 12$, you can solve it by *multiplying* each side by 3.

$$\frac{x}{3} = 12$$

This gives you $\frac{3}{3}x$, or x.

$$3 \cdot \frac{x}{3} = 3 \cdot 12$$

$$x = 36$$

$$\frac{x}{2} = 5$$

$$2 \cdot \frac{x}{2} = 2 \cdot 5$$

$$x = 10$$

$$\frac{x}{4} = 6$$

$$4 \cdot \frac{x}{4} = 4 \cdot 6$$

$$x = 24$$

Classroom Practice

You want to solve for x. By what number would you divide each side of the equation? Solve.

1. $2x = 10$
2. $4x = 24$
3. $3x = 18$
4. $5x = 40$
5. $7x = 21$
6. $8x = 88$
7. $9x = 36$
8. $12x = 36$

Written Exercises

Solve. Do one step in your head, if you wish.

$$2x = 18$$
$$\frac{2x}{2} = \frac{18}{2}$$
$$x = 9$$

You might do this step in your head.

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1. $3x = 12$ 2. $5x = 15$ 3. $6x = 42$ 4. $4a = 32$
5. $6b = 72$ 6. $4y = 16$ 7. $7x = 35$ 8. $5x = 25$
9. $2x = 20$ 10. $3x = 15$ 11. $6y = 18$ 12. $7y = 28$
13. $8m = 24$ 14. $6x = 48$ 15. $7n = 49$ 16. $4a = 36$
17. $9a = 81$ 18. $8x = 72$ 19. $9x = 108$ 20. $10a = 100$
21. $7x = 91$ 22. $12a = 84$ 23. $8x = 112$ 24. $9b = 513$
25. $3b = 540$ 26. $11m = 231$ 27. $7y = 175$ 28. $4m = 244$

Solve. Do one step in your head, if you wish.

29. $\frac{x}{2} = 9$ 30. $\frac{x}{3} = 8$ 31. $\frac{x}{4} = 11$ 32. $\frac{x}{5} = 7$
33. $\frac{a}{6} = 9$ 34. $\frac{a}{3} = 7$ 35. $\frac{n}{2} = 6$ 36. $\frac{x}{6} = 4$
37. $\frac{n}{5} = 3$ 38. $\frac{x}{2} = 10$ 39. $\frac{n}{7} = 8$ 40. $\frac{x}{3} = 11$
41. $\frac{x}{6} = 8$ 42. $\frac{a}{9} = 9$ 43. $\frac{a}{9} = 8$ 44. $\frac{x}{10} = 13$

of the equation? Solve.

9. $\frac{y}{2} = 8$ 10. $\frac{y}{5} = 9$ 11. $\frac{y}{4} = 3$ 12. $\frac{y}{6} = 5$
13. $\frac{y}{3} = 6$ 14. $\frac{y}{8} = 7$ 15. $\frac{y}{10} = 4$ 16. $\frac{y}{7} = 12$
17. $\frac{y}{15} = 3$ 18. $\frac{y}{9} = 8$ 19. $\frac{y}{30} = 6$ 20. $\frac{y}{8} = 20$