

Solutions

Page 250 #s 2cde, 3ad, 4bc,
7ace, 8b, 10, 12, 16ac, 19a, 20a

2. Solve each equation.

$$c) \frac{z}{12} = \frac{2}{3}$$

$$d) \frac{x}{6} = -\frac{4}{3}$$

$$e) -\frac{5}{2} = \frac{x}{8}$$

$$z(3) = 3(12)$$

$$x(3) = -4(6)$$

$$-5(8) = x(2)$$

$$\frac{3z}{3} = \frac{36}{3}$$

$$\frac{3x}{3} = \frac{-24}{3}$$

$$\frac{-40}{2} = \frac{2x}{2}$$

$$z = 12$$

$$x = -8$$

$$-20 = x$$

If fractions are negative, treat the numerator (top) as being negative.

3. Solve each equation.

a) $\frac{14}{x} = \frac{14}{19}$

$$14(19) = 14(x)$$

$$\frac{266}{14} = \frac{14x}{14}$$

$$19 = x$$

d) $\frac{4}{7} = -\frac{8}{x}$

$$4(x) = -8(7)$$

$$\frac{4x}{4} = \frac{-56}{4}$$

$$x = 14$$

4. Solve each equation by first using the distributive property to expand the left side.

b) $-3(4 + y) = -9$

c) $5(x - 7) = 20$

$$-3(4) - 3(y) = -9$$

$$-12 - 3y = -9$$

$$-12 - 3y + 12 = -9 + 12$$

$$\frac{-3y}{-3} = \frac{3}{-3}$$

$$y = -1$$

$$5(x) - 5(7) = 20$$

$$5x - 35 = 20$$

$$5x - 35 + 35 = 20 + 35$$

$$\frac{5x}{5} = \frac{55}{5}$$

$$x = 11$$

7. Solve each equation and check your answer. Express fraction answers in lowest terms.

$$a) \frac{x}{4} = \frac{3}{5}$$

$$x(5) = 3(4)$$

$$\frac{5x}{5} = \frac{12}{5}$$

$$x = \frac{12}{5}$$

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

$$c) \frac{7}{9} = -\frac{21}{y}$$

$$7(y) = -21(9)$$

$$\frac{7y}{7} = \frac{-189}{7}$$

$$y = -27$$

$$e) -\frac{5}{6} = \frac{2x}{9}$$

$$-5(9) = 2x(6)$$

$$\frac{-45}{12} = \frac{12x}{12}$$

$$\frac{-45}{12} = x$$

$$\frac{-15}{4} = x$$

$$-3\frac{3}{4} = x$$

8. Solve each equation and check your answer.

$$b) 3(4n-7) = -3n+9$$

$$3(4n) + 3(-7) = -3n + 9$$

$$12n - 21 = -3n + 9$$

$$12n - 21 + 3n = -3n + 9 + 3n$$

$$15n - 21 = 9$$

$$15n - 21 + 21 = 9 + 21$$

Check!

$$\frac{15n}{15} = \frac{30}{15}$$

$$n = 2$$

$$3(4(2) - 7) = -3(2) + 9$$

$$3(8 - 7) = -6 + 9$$

$$3(1) = 3$$

$$3 = 3 \quad \checkmark$$

10. Increasing a number by 14 and doubling the result gives the same value as decreasing the number by 27 and tripling the result.

a) Create an equation that could be used to find the number.

b) Use your equation to find the number.

Let $n =$ unknown number

$$a) 2(n+14) = 3(n-27)$$

(increase by 14
double it

decrease by 27
triple it

$$b) 2(n+14) = 3(n-27)$$

distribute / expand

$$\Rightarrow 2(n) + 2(14) = 3(n) + 3(-27)$$

$$2n + 28 = 3n - 81$$

$$2n + 28 - 2n = 3n - 81 - 2n$$

$$28 = n - 81$$

$$28 + 81 = n - 81 + 81$$

$$109 = n$$

12. What is the x -coordinate of the point on the line $y = \frac{2}{3}x + 5$ that has a y -coordinate of -11 ?

Sub in $y = -11$ and solve for x

$$y = \frac{2}{3}x + 5$$

$$\Rightarrow -11 = \frac{2}{3}x + 5$$

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

$$-16 = \frac{2}{3}x$$

$$-16 \times 3 = \frac{2}{3}x \times 3$$

$$\frac{-48}{2} = \frac{2x}{2}$$

$$-24 = x \quad \Rightarrow \text{The } x\text{-coordinate is } -24$$

16. Solve.

a) $\frac{x+2}{3} = 8$

$$\frac{x+2}{3} = \frac{8}{1}$$

$$1(x+2) = 8(3)$$

$$1(x) + 1(2) = 24$$

$$x + 2 = 24$$

$$x + 2 - 2 = 24 - 2$$

$$x = 22$$

c) $\frac{2y+3}{5} = 7$

$$\frac{2y+3}{5} = \frac{7}{1}$$

$$1(2y+3) = 7(5)$$

$$1(2y) + 1(3) = 35$$

$$2y + 3 = 35$$

$$2y + 3 - 3 = 35 - 3$$

$$\frac{2y}{2} = \frac{32}{2}$$

$$y = 16$$

19. Solve. Express fraction answers in lowest terms.

a) $\frac{4x}{5} = \frac{2}{3}$

$$4x(3) = 2(5)$$

$$\frac{12x}{12} = \frac{10}{12}$$

$$x = \frac{10}{12}$$

$$x = \frac{5}{6}$$

20. Solve. Express fraction answers in lowest terms.

$$a) \frac{8b+5}{2} + 6 = \frac{7}{3}$$

$$\frac{8b+5}{2} + \frac{12}{2} = \frac{7}{3}$$

$$\frac{8b+5+12}{2} = \frac{7}{3}$$

$$\frac{8b+17}{2} = \frac{7}{3}$$

$$3(8b+17) = 7(2)$$

$$3(8b) + 3(17) = 14$$

$$24b + 51 = 14$$

$$24b + 51 - 51 = 14 - 51$$

$$\frac{24b}{24} = \frac{-37}{24}$$

$$b = \frac{-37}{24}$$