C: Solving Equations: $a(x+b)=c$

Steps:

1. Multiply into bracket.
2. Isolate for the variable (get it to one side by itself).
3. Divide to solve for the variable.
4. Check if asked.

Examples:

Solve and check:

a) $4(x+3)=15.2$

$4x+12=15.2$

$-12 \quad -12$

$\frac{4x}{4}=\frac{3.2}{4}$

$x=0.8$

check:

$4(x+3)=15.2$

$4(0.8+3)=15.2$

$4(3.8)=15.2$

$15.2=15.2$

$x=0.8$ is true

★BEDMAS

b) $28.02=-14(3.86+x)$

$28.02=-54.04-14x$

$+54.04 \quad +54.04$

$\frac{82.06}{-14}=\frac{-14x}{-14}$

$-5.861428571=x$

check:

$28.02=-14(3.86-5.861428571)$

$28.02=-14(-2.001428571)$

$28.02=28.02$ ✓

c) $\frac{3}{4}(x+4)=2\frac{1}{3}$

$\frac{3}{4}\left(\frac{x}{1}+\frac{4}{1}\right)=\frac{7}{3}$

$\left(\frac{3x}{4}\right)^{12}+(3)^{12}=\left(\frac{7}{3}\right)^{4\,12}$ LCD = 12

$9x+36=28$

$-36 \quad -36$

$\frac{9x}{9}=\frac{-8}{9}$

$x=-\frac{8}{9}$

Check:

$\frac{3}{4}\left(-\frac{8}{9}+4\right)=2\frac{1}{3}$

$\left(\frac{1}{\frac{3}{4}}\right)\left(-\frac{8}{9}\right)+\left(\frac{3}{4}\right)\left(\frac{4}{1}\right)=\frac{7}{3}$

$-\frac{2}{3}+\frac{3}{1}=\frac{7}{3}$

$-\frac{2}{3}+\frac{9}{3}=\frac{7}{3}$

$\frac{7}{3}=\frac{7}{3}$

d) $\frac{4(x-6)}{6} = \frac{2}{4}$

$\frac{(4x-24)}{6} = \frac{2}{4}$

$(4)(4x-24) = (6)(2)$

$16x - 96 = 12$

$+96 \quad +96$

$\frac{16x}{16} = \frac{108}{16}$

$x = 6.75$

Check

$\frac{4(x-6)}{6} = \frac{2}{4}$

$\frac{4(6.75-6)}{6} = \frac{2}{4}$

$\frac{4(0.75)}{6} = \frac{2}{4}$

$\frac{3}{6} = \frac{2}{4}$

$\frac{1}{2} = \frac{1}{2}$

Assignment Pg. 319 # 6 - 12

C: Solving $a(x+b)=c$ Continued

Reminder

x- statement

Equation

Solve

Sentence

Examples:

1. The mean of two numbers is 6.4. One of the numbers is 16.2. What is the other number?

$\text{mean} = \frac{\# + \# + \# + \# \ldots}{\text{how many numbers.}}$ x is other number

$6.4 = \frac{16.2 + x}{2}$

$\frac{6.4}{1} \times \frac{(16.2 + x)}{2}$

$(16.2 + x) = (6.4)(2)$

$16.2 + x = 12.8$

$-16.2 \qquad -16.2$

$\boxed{x = -3.4}$ The other number is 6.4.

2. The regular pentagon has a perimeter of 37.6 cm. What is the value of x? What is the side length?

$x-6$

Perimeter = 5 x side length

$37.6 = 5(x-6)$

$37.6 = 5(x-6)$

$37.6 = 5x - 30$

$37.6 = 5x - 30$

$+30 \qquad +30$

$67.6 = 5x$

$\frac{67.6}{5} = \frac{5x}{5}$

$\boxed{13.52 = x}$

side length $= x - 6$

$= 13.52 - 6$

$\boxed{= 7.52 \text{ cm}}$

The value of x is 13.52 cm ; the side length is 7.52 cm.

3. You buy 4 cans of paint using a coupon that takes off $3.50 from each can. If you pay $185.96 altogether, what is the regular price of each can?

x - regular price

TOTAL COST = 4(cost of one can)

$185.96 = 4(regular − 3.50)

$185.96 = 4(x − 3.50)

185.96 = 4x − 14

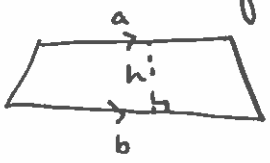
+14 +14

$\frac{199.96}{4} = \frac{4x}{4}$

$49.99 = x

The regular price of each can is $49.99

4. The area of a trapezoid is $A = \frac{1}{2}(a+b)h$.



Find h if $A = 54.6\text{cm}^2$, $a = 4.6\text{cm}$, $b = 9.4\text{cm}$.

$A = \frac{1}{2}(a+b)h$

$54.6 = \frac{1}{2}(4.6+9.4)h$ ★ BEDMAS

$54.6 = \frac{1}{2}(14)h$

$54.6 = \frac{1}{2}\left(\frac{14}{1}\right)\left(\frac{h}{1}\right)$

$54.6 = \frac{7h}{1}$

$\frac{54.6}{7} = \frac{7h}{7}$

7.8cm = h

b) Find a if $A = 60\text{cm}^2$, $b = 5.7\text{cm}$, $h = 9\text{cm}$

$A = \frac{1}{2}(a+b)h$

$60 = \frac{1}{2}\left(\frac{a}{1} + \frac{5.7}{1}\right)(9)$

$60 = \left(\frac{a}{2} + \frac{5.7}{2}\right)\left(\frac{9}{1}\right)$

$60 = \frac{9a}{2} + \frac{51.3}{2}$

$60 = \frac{9a}{2} + 25.65$

$-25.65 \quad -25.65$

$\frac{34.35}{1} \times \frac{9a}{2}$

$\frac{9a}{9} = \frac{68.7}{9}$

$a = 7.63\text{cm}$

Pg. 320 #12-22, 25

Assignment Pg. 320 # 12 - 22, 25