

Algebra I		
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1) $x + (x+1) = 43$ 21, 22	7) $x(x+2) = 168$	13) $x + (x+2) + (x+4) = x + 40$ 17, 19, 21
2) $x + (x+1) + (x+2) = 69$ 22, 23, 24	8) $x(x+2) = 195$	14) $x + (x+2) + (x+4) = (x+1) + 30$ 14, 16, 18
3) $x + (x+1) + (x+2) + (x+3) = -116$ -28, -27, -26, -25	9) $x + (x+2) + (x+4) + (x+6) = -110$ -28, -26, -24, -22	15) $x(x+1) = 5[x + (x+1)] - 5$
4) $x + (x+1) + (x+2) + (x+3) = -46$ -12, -11, -10, -9	10) $x + 2 = 2x - 6$ 8, 10	16) $x(x+2) = 6[x + (x+2)] - 1$
5) $x + (x+2) + (x+4) = 75$ 23, 25, 27	11) $x + (x+2) + (x+4) + (x+6) = 36$ 6, 8, 10, 12	
6) $x + (x+2) + (x+4) = 147$ 47, 49, 51	12) $x = \frac{1}{2}(x+2) + 5$ 12, 14	

3) The sum of four consecutive integers is -106.

Let $x =$ smallest

-28
-27
-26
-25

$x+1 = 2^{\text{nd}}$
 $x+2 = 3^{\text{rd}}$
 $x+3 =$ largest

$$x + (x+1) + (x+2) + (x+3) = -106$$

$$4x + 6 = -106$$

$$4x + 6 - 6 = -106 - 6$$

$$\frac{4x}{4} = \frac{-112}{4}$$

$$x = -28$$

6) The sum of three consecutive odd integers is 147.

Let $x =$ smallest
 $x+2 = 2^{\text{nd}}$
 $x+4 =$ largest

$$x + (x+2) + (x+4) = 147$$

$$3x + 6 = 147$$

10) The greater of two consecutive even integers is six less than twice the smaller.

Let $x =$ smallest

8
10

$x+2 =$ largest

$$x+2 = 2x - 6$$

$$x - x + 2 = 2x - x - 6$$

11) Four cousins were born at two-year intervals. The sum of their ages is 36.

Let $x =$ youngest
 $x+2 = 2^{\text{nd}}$
 $x+4 = 3^{\text{rd}}$
 $x+6 =$ oldest

$$x + (x+2) + (x+4) + (x+6) = 36$$

$$4x + 12 = 36$$

12) The smaller of two consecutive even integers is five more than one half of the greater.

Let $x =$ smaller

12
14

$x+2 =$ larger

$$x = \frac{1}{2}(x+2) + 5$$

$$x = \frac{1}{2}x + 1 + 5$$

$$x = \frac{1}{2}x + 6$$

$$2x = x + 12$$

Here are 2 different ways to solve this problem.

$$2x = 1(\frac{1}{2}(x+2) + 5) + 10$$

$$2x = \frac{1}{2}(x+2) + 10 + 10$$

$$2x = \frac{1}{2}(x+2) + 20$$

$$2x = \frac{1}{2}x + 1 + 20$$

$$2x = \frac{1}{2}x + 21$$

$$2x - \frac{1}{2}x = 21$$

$$\frac{4x}{2} - \frac{x}{2} = 21$$

$$\frac{3x}{2} = 21$$

$$3x = 42$$

$$x = 14$$

Note that the underlined section constitutes one group, thus the 2 can only be used on this group once. We can distribute it in with the $(x+2)$ or we can cancel the $1/2$. It makes more sense to cancel the $1/2$.

- 13) The sum of three consecutive odd integers is 40 more than the smallest. What are the integers?

$$x + (x+2) + (x+4) = x + 40$$

Let x = smallest
 $x+2$ = 2nd
 $x+4$ = largest

- 15) Find two consecutive integers whose product is 5 less than 5 times their sum.

$$x(x+1) = 5(x+x+1) - 5$$

Let x = smallest
 $x+1$ = largest

The only way we can get the sum to happen before the product is to use a grouping symbol, () or []. I chose brackets, [], for the final answer for a neater look.