**0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

**Mathematics: Understanding variables**

**A + B = C, A = C – B, C = A + B, C – A = B**

**2 + 3 = 5, 2 = 5 – 3, 5 = 2 + 3, 5 – 2 = 3**

**4 + 5 = 9, 4 = 9 – 5, 9 = 4 + 5, 9 – 4 = 5**

**A – B = C, A = C + B, C = A – B, C + B = A**

**9 – 6 = 3, 9 = 3 + 6, 3 = 9 – 6, 3 + 6 = 9**

**11 – 7 = 4, 11 = 4 + 7, 4 = 11 – 7, 4 + 7 = 11**

**0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

2 + 3 = ?

7 – 4 = ?

11 + 6 = ?

17 – 8 = ?

Now replace the “?” with an “X” and then solve for “X”.

**0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

2 + 3 = X

7 – 4 = X

11 + 6 = X

17 – 8 = X

And then

4 + X = 7 (X = 7 – 4)

Trick: subtract 4 from both sides of the equation, like this:

4 – 4 + X = 7 – 4 or 0 + X = 7 – 4 or X = 7 – 4

**0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

8 – X = 2 (8 = 2 + X, or 8 – 2 = X)

21 + X = 28 (X = 28 – 21)

14 – X = 5 (14 = 5 + X, or 14 – 5 = X)

X + 7 = 12 (X = 12 – 7)

X – 4 = 6 (X = 6 + 4)

X + 12 = 17 (X = 17 – 12)

X – 5 = 3 (X = 3 + 5)

**0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20**

2 X 3 10 4 X 7 X 13  
 + X + 5 + 5 + X +9 +6 + 8 +1 +X

7 9 X 15 X 12 X 12 17

15 X 10 7 9 X 14 17 X

--X --5 --6 --2 --X --8 -- 9 --X --3

7 4 X X 2 5 X 4 10

Because the “X” is now used as a main variable in math equations, the multiplication symbol “X” [as in +, ­, ÷, x, or plus, minus, divide, and multiply] is now then confusing. Therefore, multiplication will be done with a dot [**·**] between numbers and variables; it will also be done with parentheses ( ); and also simply by placing numbers and variables beside each other to imply multiplication.

Here are some examples of this:

2X = 4, which is read 2 times X equals 4.

It can also be done as 2(X) = 4, and is also read as 2 times X equals 4.

It can also be done as 2 · X = 4, which is also read as 2 times X equals 4.

Now it may be time to show multiplication and division with variables, and how they can be seen, and manipulated:

3X + 5 = 17

3X = 17 – 5

3X = 12

X = 12  
 3

X = 4

4X – 12 = 8

4X = 8 + 12

4X = 20

X = 20  
 4

X = 5

3X + 2X = 4  
5 10

6X + 2X = 4

10 10

8X = 4  
10

8X = 40

X = 40  
 8

X = 5

12X – 9X = 15  
 3 6

24X – 9X = 15  
 6 6

24X – 9X = 15  
 6

15X = 15  
 6

15X = 6(15)

15X = 90

X = 90  
 15

X = 6