

Multiplying by Parts a Useful Math Trick

Sometimes, when asked to multiply, it is useful to break one of the numbers up into a sum or a difference, and multiply each part by the other number. This is called the distributive principle.

Here are some examples:

- (1) Multiply 34 by 9: This is the same as $34 \times (10 - 1)$. So do $34 \times 10 - 34 \times 1$. This equals $340 - 34 = 306$.
- (2) Multiply 34 by 12: This is the same as $34 \times (10 + 2)$. So do $34 \times 10 + 34 \times 2$. This equals $340 + 68 = 408$.

This becomes very useful when dealing with two numbers that I bump into where I have to multiply by them. They are the numbers 2.2 and 1.8. Here is why I bump into them:

To convert kilograms to pounds, multiply by 2.2. So if I have to convert 73 kg, I look at this the following way:

$73 \times 2.2 = 73 \times (2 + 0.2)$ or $73 \times (2 \text{ plus } 1/10^{\text{th}} \text{ of } 2)$. So I do 73×2 to get 146. I move the decimal place one place to the left to take $1/10^{\text{th}}$ of 146, this gives me 14.6. I now add the two results: $146 + 14.6 = 160.6$ lbs.

To convert Celsius (or Centigrade) to Fahrenheit degrees, the equation is: $F = \frac{9}{5}C + 32$, or $F = 1.8C + 32$.

So if I had a Celsius temperature of 64 degrees, I first multiply it by 1.8, and then I add 32. So my working goes like this:

$64 \times 1.8 = 64 \times (2 - 0.2) = 64 \times (2 \text{ minus } 1/10^{\text{th}} \text{ of } 2)$. So I do 64×2 to get 128. I move the decimal place one place to the left to take $1/10^{\text{th}}$ of 128, this gives me 12.8. I now subtract the two results: $128 - 12.8 = 115.2$. I now add 32 to get 147.2 degrees Fahrenheit.

Here is another example of the same problem. I have a day with the temperature 15 degrees Celsius. What is it in Fahrenheit?

$15 \times 1.8 = 15 \times (2 - 0.2) = 15 \times (2 \text{ minus } 1/10^{\text{th}} \text{ of } 2)$. So I do 15×2 to get 30. I move the decimal place one place to the left to take $1/10^{\text{th}}$ of 30, this gives me 3.0. I now subtract the two results: $30 - 3 = 27$. I now add 32 to get 59 degrees Fahrenheit.