# E=MC^2

Problem written by Chris, discovered by Einstein

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One of the exciting human discoveries is that mass and energy are interchangable and are related by the equation $E = M \times C^2$. This relationship was uncovered by Albert Einstein almost 100 years ago and we now know that the sun produces its heat by transforming small amounts of mass into large amounts of energy.

Write a program that continually reads in mass from the user and then outputs the amount of energy. Show your work in the following way:

```
Enter kilos of mass: 27
e = m * C^2...
m = 27.0 kg
C = 2.99792458E8 m/s
2.4266389825894077E18 joules of energy!

Enter kilos of mass: 15
e = m * C^2...
m = 15.0 kg
C = 2.99792458E8 m/s
1.3481327681052265E18 joules of energy!

Enter kilos of mass: 2
e = m * C^2...
m = 2.0 kg
C = 2.99792458E8 m/s
1.7975103574736352E17 joules of energy!

Enter kilos of mass: 0.00000001
e = m * C^2...
m = 1.0E-8 kg
C = 2.99792458E8 m/s
8.987551787368177E8 joules of energy!

Enter kilos of mass: 0.000000000000000000000000001
e = m * C^2...
m = 1.0E-27 kg
C = 2.99792458E8 m/s
8.987551787368177E-11 joules of energy!

Enter kilos of mass: 0.000000000000001
e = m * C^2...
m = 1.0E-15 kg
C = 2.99792458E8 m/s
89.87551787368177 joules of energy!
```

If you ask the user to input kilograms, and you use speed of light equals 299792458 (which is in meters per second) the result of calculating $E = M \times C^2$ will be in Jouls.

Note that 3.0E8 is scientific notation for $3.0 \times 10^8$... which is 300,000,000. You don't need to do anything for java to print doubles in scientific notation. It will automatically do so when numbers get big enough.

Since the speed of light will never change, it makes sense to declare it as a constant.