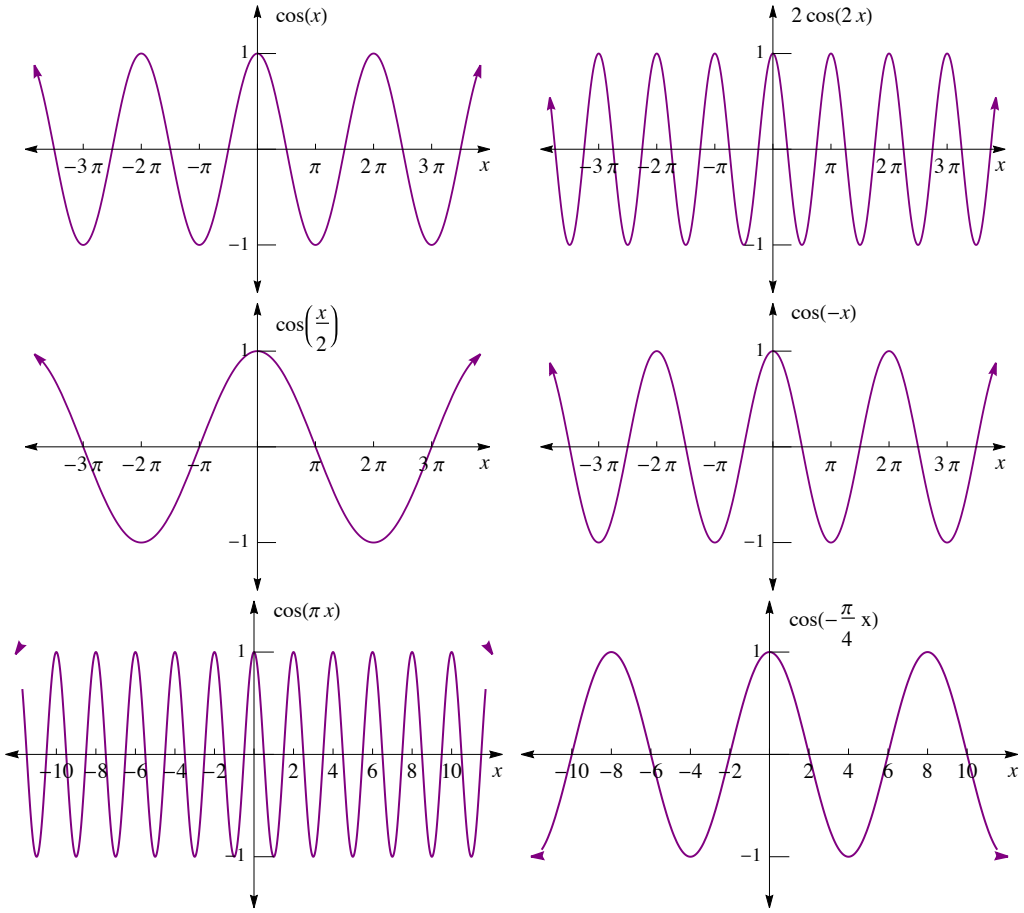
Trigonometry 28: Sin and Cos: Period

A very general way of writing the sine and cosine functions is:

$$y = a\sin(b\,x - c) + k$$
$$y = a\cos(b\,x - c) + k$$

If we look at the simplest case, $y = \cos(x)$, which is the first graph below, we can see that the peaks of the function occur every $2\,\pi$ rads. This "distance" (always a non-negative number) at which the function repeats itself is called its **period** (which is also why the trig functions are **periodic functions**). Let's look for a pattern for the family of functions $y = \cos(b\,x)$:



Using the graphs, we can summarize:

b	**Period of $\cos(b\,x)$ [in radians]**
1	$2\,\pi$
2	π
1/2	$4\,\pi$
−1	$2\,\pi$
π	2
$-\pi/4$	8

From this table the relationship between the parameter b and the period, T, is:

$$T = \left|\frac{2\,\pi}{b}\right|$$