

Variation

y varies directly as x	means	$y = kx$	(for some constant k)
y varies directly as the nth power of x	means	$y = kx^n$	(for some constant k)
y varies inversely as x	means	$y = \frac{k}{x}$	(for some constant k)
y varies inversely as the nth power of x	means	$y = \frac{k}{x^n}$	(for some constant k)

Ex 1.

If y varies directly as x , and $y = 20$ when $x = 4$, find y when $x = 9$.

Ex 2.

If y varies inversely as x , and $y = 3$ when $x = 8$, find y when $x = 6$.

Ex 3.

The distance a body falls from rest varies directly as the square of the time it falls (ignoring air resistance). If a sky diver falls 64 ft in 2 sec, how far will she fall in 8 sec?

Ex 4.

The force with which Earth attracts an object (gravitational force) above Earth's surface varies inversely as the square of the object's distance from the center of Earth. If an object 4000 mi from the center of Earth is attracted with a force of 160 lbs, find the force of attraction on an object 6000 mi from the center of the Earth.

Practice

1. If y varies inversely as the square of x , and $y = 5$ when $x = 2$, find y when $x = 10$.
2. For a given base, the volume of a pyramid varies directly as its height. A pyramid with height 50 m has volume 1000 m^3 . Find the volume of a pyramid when the height is 40 m.

Q: Your sock drawer contains ten pairs of white socks and ten pairs of black socks. If you're only allowed to take one sock from the drawer at a time and you can't see what color sock you're taking until you've taken it, how many socks do you have to take before you're guaranteed to have at least one matching pair?