

## شكراً لتحميلك هذا الملف من موقع المناهج الإماراتية



## شرح الدرس الخامس Variation من الوحدة السابعة

موقع المناهج ⇨ المناهج الإماراتية ⇨ الصف الحادي عشر المتقدم ⇨ رياضيات ⇨ الفصل الأول ⇨ الملف

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## التواصل الاجتماعي بحسب الصف الحادي عشر المتقدم



## روابط مواد الصف الحادي عشر المتقدم على تلغرام

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## المزيد من الملفات بحسب الصف الحادي عشر المتقدم والمادة رياضيات في الفصل الأول

[أوراق عمل الدرس الرابع Graphing rational functions من الوحدة السابعة](#)

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المزيد من الملفات بحسب الصف الحادي عشر المتقدم والمادة رياضيات في الفصل الأول

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ريفييل السابعة الوحدة من

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# Variation

Type of Variation	phrase	simple equation example	practical example	more complicated equations
Direct	"is directly proportional to"  "varies directly with"	$y = kx$  y varies directly with x	The radius of the circle lit by a car's light <b>decreases</b> (y) as the distance away from the garage <b>decreases</b> (x).	$y = kx^2$  y varies directly with $x^2$
Inverse	"varies inversely with"	$y = k/x$  y varies inversely with x	The brightness of a car's lights <b>increases</b> (y) as the distance away from the garage <b>decreases</b> (x).	$y = k/x^3$  y varies inversely with $x^3$
Joint	"varies jointly (directly) with"  "depends upon both . . ."	$y = kxz$  y varies jointly with x and z	The heat loss through a glass window (y) varies jointly with the area of the window (x) and the temperature difference (z) between inside and outside.	$y = kx^3z^2$  y varies jointly with $x^3$ and $z^2$
Combined	"varies directly with x and inversely with z"	$y = kx/z$  y varies directly with x and inversely with z	The radius of the circle lit by a car's light <b>decreases</b> (y) as the distance away from the garage <b>decreases</b> (x), but the nervousness of the new driver <b>increases</b> (z) (he's afraid he's going to hit the door)!!!!!!	$y = \frac{k\sqrt{x}}{z^4}$  y varies directly with the square root of x and inversely with $z^4$

**Ex1:** If  $y$  varies directly as  $x$ , and  $y = 360$  when  $x = 180$ , find  $y$  when  $x = 270$

$$y = kx$$

To find  $k$

$$\frac{360}{180} = \frac{k(180)}{180} \Rightarrow k = 2$$

Equation :  $y = 2x$

$$y = 2(270) = 540$$

**Ex2:** If  $y$  varies inversely as  $x$ , and  $y = 6$  when  $x = 5$ , find  $y$  when  $x = 10$

$$y = \frac{k}{x}$$

$$6 = \frac{k}{5} \Rightarrow k = 5 \times 6 = 30$$

Equation :  $y = \frac{30}{x}$

$$y = \frac{30}{10} \Rightarrow y = 3$$

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**Ex3:** if  $y$  varies jointly as  $x$  and  $z$ , and  $y = -16$  when  $x = 4$  and  $z = 2$ , find  $y$  when  $x$  is  $-1$  and  $z$  is  $7$

$$y = kxz$$

$$-16 = k(4)(2)$$

$$\frac{-16}{8} = \frac{8k}{8} \Rightarrow k = -2$$

Equation :  $y = -2xz$

$$y = -2(-1)(7) = 14$$

→ Combined ←

**Ex4:** Suppose **a** varies **directly** as **b**, and **a** varies **inversely** as **c**. Find **b** when **a = 2.5** and **c = 18**, if **b = 6** when **c = 4** and **a = 96**

to find k

$$a = \frac{kb}{c}$$

$$\frac{4}{6} \cdot 96 = \frac{k(6)}{4} \cdot \frac{4}{6}$$

$$k = 64$$

Equation :  $a = \frac{64b}{c}$  050-7214939

$$\frac{18}{64} \cdot 2.5 = \frac{64b}{18} \cdot \frac{18}{64}$$

$$b = 0.703$$

**Ex5:**

State whether each equation represents a *direct*, *joint*, *inverse*, or *combined* variation for the given variable. Then name the constant of variation.

26.  $c = 12m; c$   
 $c = km$   
direct

27.  $p = \frac{4}{q}; p$   
 $p = \frac{k}{q}$   
inverse

28.  $A = \frac{1}{2}bh; A$   
 $A = kbh$   
Joint

29.  $\frac{rw}{w} = 15; r$   
 $r = \frac{k}{w}$   
inverse

30.  $y = 2rgt; y$   
 $y = krgt$   
Joint

31.  $f = 5280m; f$   
 $f = km$   
direct

**Ex6: PRESSURE** The volume of a gas varies directly with the temperature and inversely with the pressure. A certain gas has a volume of 15 L, a temperature of 290 K, and a pressure of 1 atm. If the gas is compressed to a volume of 12 L and is heated to 310 K, what will the new pressure be? Round your answer to the nearest thousandth.

$$V = \frac{k t}{P}$$

$$15 = \frac{k(290)}{1}$$

$$\frac{15}{290} = \frac{290k}{290} \Rightarrow k = \frac{3}{58}$$

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Equation :  $V = \frac{\frac{3}{58} t}{P}$

$$\Rightarrow 12 = \frac{\frac{3}{58} \times 310}{P}$$

$$\frac{12}{1} = \frac{\frac{465}{29}}{P} \Rightarrow \frac{465}{12 \cdot 29} = 12P \cdot \frac{1}{12}$$

$$P = \frac{155}{116} \approx 1.336$$