

Combined variations.

More than one variation relationship happening at the same time.

Every variation equation has a variation constant, therefore, all variation equations have k .

Model each statement with a variation equation using k for the variation constant.

1. Q varies directly with W and inversely with G .

$$Q = \frac{kW}{G} \text{ or } k \frac{W}{G}$$

2. R varies directly with the square of T and inversely with the cube of Z .

$$R = \frac{k \cdot T^2}{Z^3}$$

3. N varies directly with A and inversely with the product of P and Q .

$$N = \frac{kA}{PQ} \text{ or } k \frac{A}{PQ}$$

4. R varies jointly with A and the square of E .

$$R = kAE^2$$

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$$\begin{aligned} -90 &= k \cdot 2(3)^2 \\ -90 &= 18k \end{aligned}$$

Write a variation equation if $R = -90$ when $A = 2$ and $E = 3$.

$$k = -5$$

$$R = -5AE^2$$

Find A when $R=20$ and $E=10$

$$20 = -5A(10)^2$$

$$20 = -500A$$

$$-.04 = A$$

W varies directly with M and inversely with Q.
 W = 1 when M = 12 and Q = 18.

$$W = \frac{KM}{Q}$$

$$1 = \frac{K \cdot 12}{18}$$

$$1.5 = K$$

1. Write a variation equation.

$$W = \frac{1.5M}{Q}$$

2. Find W when M = 20 and Q = 48.

$$W = \frac{1.5(20)}{48} = \boxed{.625}$$

Y varies directly with the cube of Z and inversely with the product of C and D.

$$Y = \frac{KZ^3}{CD}$$

Write a direct variation equation if $y=25.2$ when $C=3$, $D=10$, and $Z=6$.

$$y = \frac{3.5Z^3}{CD}$$

$$25.2 = \frac{K \cdot 216}{30}$$

$$K = 3.5$$

Find Z when $y=1000$, $c=48$, and $D=18$

$$1000 = \frac{3.5Z^3}{864}$$

$$Z = \sqrt[3]{(1000 \cdot 864) \div 3.5} = \boxed{62.73}$$

Write a sentence that describes this variation equation.

$$Q = \frac{8}{XY}$$

Q varies inversely with the product of X and Y

Since 8 is the variation constant you dont need to mention it in your sentence.

Write a sentence that describes this variation equation.

$$P = \frac{5m^3n^2}{r}$$

P varies jointly with the cube of m and the square of n and inversely with r.

Since 5 is the variation constant you dont need to mention it in your sentence.

Suppose x and y vary inversely. Write an Inverse Variation function if $x=18$ and $y=4$.

$$K = (18)(4) = 72$$

$$xy = 72$$

Find x when $y = 25$

$$x(25) = 72$$

$$x = 2.88$$

You can now finish Hwk #3. Sec 9-1

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Problems 20-22, 25, 26, 50, 51, 53

Due Monday