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

a) Model the above statement with a combined variation equation.

b) Find the variation constant if Y=50 when Z=5, C=4, and D=10

c) Find the value of Y if Z=4, C=2, and D=5.

d) Find the value of D if Y=100, Z=2, and C=9.

2. Write this combined variation in words:

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

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3. a) These points form a direct variation relationship. Find the missing value.

(8,4) & (20,?)

b) Find the missing value if these two points are part of an inverse variation relationship.

4. Suppose that t varies directly with s and inversely with the square of r.

a) How is the value of t changed when the value of s is doubled?

b) How is the value of t changed when the value of r is doubled?

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

a) Model the above statement with a combined variation equation.

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

b) Find the variation constant if Y=50 when Z=5, C=4, and D=10

$$50 = \frac{K(5)^3}{(4)(10)}$$

$$K = 16$$

c) Find the value of Y if Z=4, C=2, and D=5.

$$Y = \frac{16(4)^3}{(2)(5)} = 102.4$$

d) Find the value of D if Y=100, Z=2, and C=9.

$$100 = \frac{16(2)^3}{9D}$$

$$D \cdot 100 = \frac{128}{9D} \cdot D$$

$$\frac{100D}{100} = \frac{128}{9} \cdot \frac{1}{100}$$

$$D = \frac{128}{9} \cdot \frac{1}{100}$$

$$D \approx .142$$

2. Write this combined variation in words:

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

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

3. a) These points form a direct variation relationship. Find the missing value.

(8,4) & (20,?)

$$k = \frac{x}{y} = 8 \cdot 4 = 32$$

$$20y = 32$$

$$y = 1.6$$

b) Find the missing value if these two points are part of an inverse variation relationship.

$$k = \frac{y}{x} = \frac{4}{8} = \frac{1}{2}$$

$$y = \frac{1}{2}(20)$$

$$y = 10$$

4. Suppose that t varies directly with s and inversely with the square of r.

a) How is the value of t changed when the value of s is doubled?

$$t = \frac{ks}{r^2}$$

$$t = \frac{k(2s)}{r^2} = 2 \cdot \frac{ks}{r^2}$$

It is doubled

b) How is the value of t changed when the value of r is doubled?

$$t = \frac{ks}{(2r)^2} = \frac{ks}{4r^2} = \frac{1}{4} \cdot \frac{ks}{r^2}$$

It will be one fourth as big.