The graph of an Inverse Variation relationship passes through the point (5,24). Find another point that could be on this graph.

$K = 5 \cdot 24 = 120$

You can pick and point such that $x \cdot y = 120$

$(1, 120)$ $(24, 5)$ $(-5, -24)$ . . .

The graph of a Direct Variation relationship passes through the point (20,-15). Find another point that could be on this graph.

$K = \frac{y}{x} = \frac{-15}{20} = -3/4$

you can pick any pt where $\frac{y}{x}$ reduces to $-3/4$

ex: $(4, -3)$

$(-20, 15)$

$(8, -6)$ . . .

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.

If the relationship is Direct Variation then the equation is

$y = kx$

If the relationship is Inverse Variation then the equation is

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

Therefore, k is either going to be the leading coefficient
or
the coefficient of the numerator.

Remember the phrase: "Y varies directly with X"

This part of a statement tells you to write

$y =$

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

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

$$Q = \frac{KW}{G} = K \cdot \frac{W}{G}$$

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

$$R = \frac{KT^2}{Z^3}$$

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

$$N = \frac{KA}{P \cdot Q}$$

R varies jointly with A and the square of E.

Joint Variation means direct variation with more than one variable

$$R = KAE^2$$

R varies jointly with A and the square of E.

$$R = KAE^2$$

Write a variation equation if R = -90 when A = 2 and E = 3. Include the proper value of k

$$-90 = K(2)(3)^2$$
$$-90 = 18K$$
$$K = -5$$

$$R = -5AE^2$$

Find A when R=20 and E=10

$$20 = -5(A)(10)^2$$
$$\frac{20}{-500} = \frac{-500A}{-500}$$

$$A = -.04$$

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

$W = \frac{KM}{Q}$ $\quad 1 = \frac{K12}{18} \cdot \frac{18}{12} \rightarrow K = 1.5$

1. Write a variation equation. Include the proper value of k

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

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

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

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

Write a direct variation equation if y=25.2 when C=3, D=10, and Z=6. Include the proper value of k

$Y = \frac{K Z^3}{CD}$ $\quad 25.2 = \frac{K\,216}{30}$

$K = 3.5$

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

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

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

$\sqrt[3]{\frac{1000 \cdot 864}{3.5}} = \sqrt[3]{Z^3}$

$Z = 62.73$

Describe this combined variation:

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

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

You can now finish Hwk #35. Sec 9-1

Pages 491 Due Tomorrow

Problems 9, 10, 12, 13, 21, 22, 26, 35, 42, 43, 50