Variation

#15

Direct Variation: y varies directly as x if there is some nonzero constant k such that: $y = kx$

k is the constant of variation
x is the variable

product of a constant and variable

Inverse Variation: y varies inversely as x if there is some nonzero constant k such that $y = \frac{k}{x}$ $x \neq 0$

Joint Variation: y varies jointly as x & z if there is some nonzero constant k such that: $y = kxz$ $x \,\&\, z \neq 0$

1. If y varies directly as x & y = 6 when x = 11, find y when x = 3.

find k:

$y = kx$

$\frac{6}{11} = \frac{K(11)}{11}$

$K = \frac{6}{11}$

$y = \frac{6}{11}(3)$

$y = \frac{18}{11}$

2. If y varies inversely as x & y=10 when x=20, find x when y=16.

find k:

$10 = \frac{K}{20}$

$200 = K$

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

$\frac{16}{1} = \frac{200}{x}$

$16x = 200$

$x = \frac{200}{16} = 12\frac{1}{2}$

3. The volume of a cone varies jointly as the square of the radius of the base, r, & the height, h. Find the eq. of joint variation if V=285, r=4, h=17.

find k:

$y = kxz$

$285 = K(4)^2(17)$

$\frac{285}{272} = \frac{272K}{272}$

$1.05 = K$

$V = 1.05r^2h$

The circumference of a circle is proportional to the radius with a constant of 2π

varies Directly

$C = 2\pi r$

Boyle's law states that the volume of an enclosed gas (at a constant temperature) varies inversely as the applied pressure.

$V = T/P$

2.2 Power Functions

Power Function $y = k \bullet x^n$

when k & n are non-zero constants

k - constant of variation

n - power - when n is negative then it's an inverse variation Why??

Which of the following are power functions?? If they are a power function - what is the constant of variation, is it direct or inverse variation?

$y = 5 \cdot x^{\frac{1}{2}}$ direct

Yes

$y = 7^x$

No

$y = \frac{3}{4} \cdot x^{-\frac{5}{2}}$ yes Inverse

Monomial Function

$$y = k \bullet x^n \qquad y = k$$

n is positive

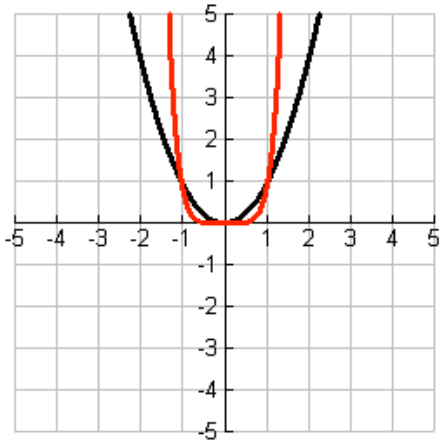
Which of the following are monomial functions?? If they are- what is the degree and the coefficient?

$y = -5 \bullet x^{-3}$ no

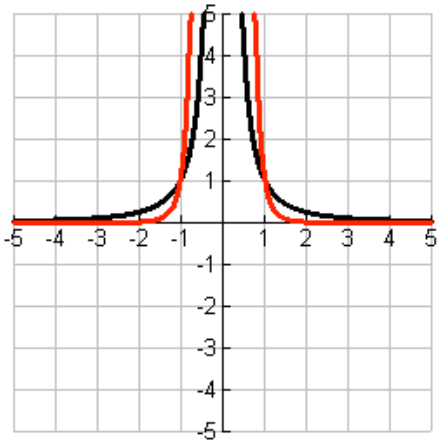
$y = -6$ yes

$y = \frac{3}{4} \bullet x$ yes

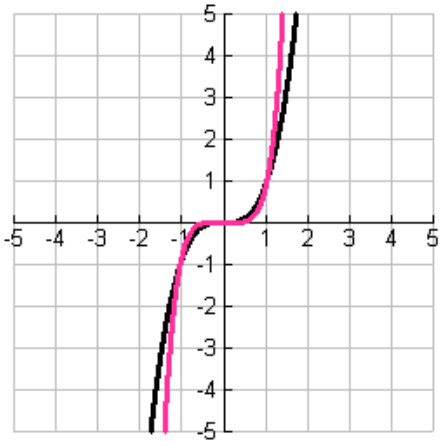
$$y = k \bullet x^{even}$$



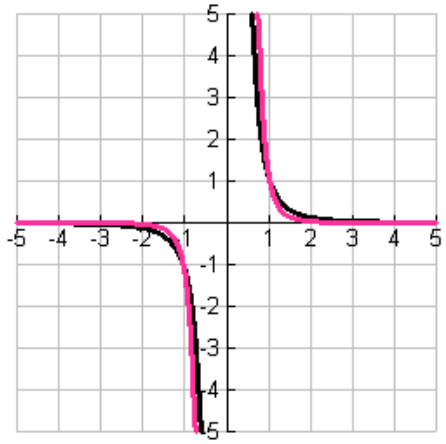
$$y = k \bullet x^{-even}$$



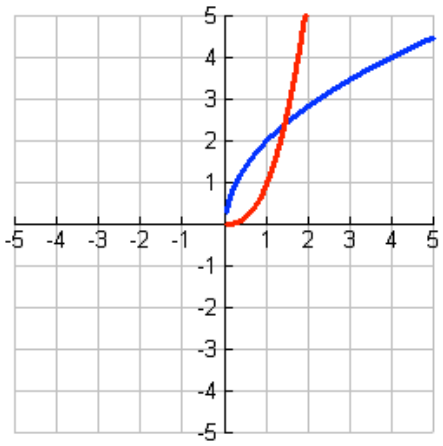
$$y = k \bullet x^{odd}$$



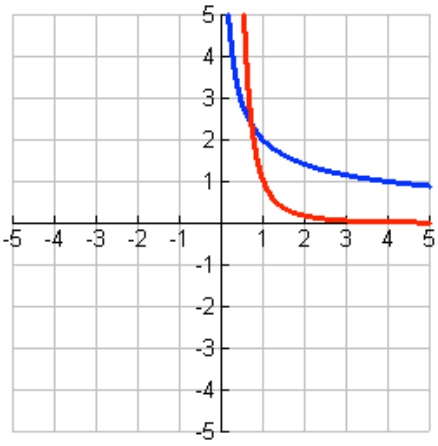
$$y = k \bullet x^{-odd}$$



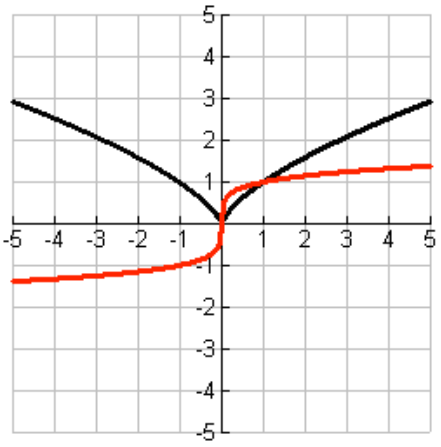
$$y = k \bullet x^{\frac{\#}{even}}$$



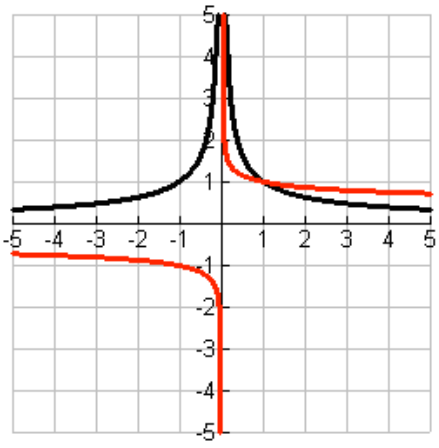
$$y = k \bullet x^{-\left(\frac{\#}{even}\right)}$$



$$y = k \bullet x^{\frac{\#}{odd}}$$



$$y = k \bullet x^{-\left(\frac{\#}{odd}\right)}$$



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