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College Algebra 1/22/2015

§2.2 (Cont'd)

$x^2 + y - 144 = 0$

x-symm (last class)

y-symm (last class)

origin symm.

(Repl x w/ $(-x)$ and y w/ $(-y)$

COMPARE

Sidework

$(-x)^2 = (-x)(-x)$
$= +x^2$

$(-x)^2 + (-y) - 144 = 0$

$x^2 - y - 144 = 0$

Different! So there is NO origin symmetry

§2.5 Variation

(4) Write an equation.
A varies directly with x^2.

$A = K \cdot \frac{x^2}{1}$

$A = K \cdot x^2 \rightarrow \boxed{A = Kx^2}$

(8) Write an equation.
The square of T varies directly with the cube of a and inversely withe the square of d.

$\boxed{T^2 = K \cdot \frac{a^3}{d^2}}$

↑ Lacoste :)

$\boxed{T^2 = \frac{K}{1} \cdot \frac{a^3}{d^2} \quad T^2 = \frac{Ka^3}{d^2}}$

↑ my math lab

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§2.5 Variation

④ Write an equation.
A varies directly with x^2.

$A = k \cdot \frac{x^2}{1}$

$A = k \cdot x^2 \rightarrow \boxed{A = kx^2}$

⑧ Write an equation.
The square of T varies directly with the cube of a and inversely with the square of d.

$T^2 = k \cdot \frac{a^3}{d^2}$

$T^2 = \frac{k}{1} \cdot \frac{a^3}{d^2}$

$T^2 = \frac{ka^3}{d^2}$

↑ Lacoste 11

↑ my math lab

(10) Write an equation F varies jointly with S and h.

↑ =K

$F = K\frac{Sh}{1}$

$F = KSh$

$\boxed{F = KSh}$ answer.

"inversely" ⇒ denominator

"jointly" ⇒ numerator together

"directly" ⇒ numerator

(5) Determining the constant of prop. "K"

f varies inversely with d^2 f=24 when d=6

$F = K \cdot \frac{1}{d^2}$ $\quad F=24,\ d=6$

$F = \frac{K}{1} \cdot \frac{1}{d^2}$ $\quad 24 = \frac{K}{6^2}$

$\boxed{F = \frac{K}{d^2}}$ $\quad 36 \cdot 24 = \frac{K}{36_1} \cdot 36$

together $\rightarrow \boxed{864 = K}$

$\boxed{F = \frac{864}{d^2}}$

(6) Write a general formula to describe the variation. z varies directly with the sum of the squares of x and y; $z=4$ when $x=4$ and $y=6$

$$z = k \cdot \frac{x^2+y^2}{1}$$

$$z = k(x^2+y^2)$$

$z=4 \quad x=4 \quad y=6 \quad k=?$

$$4 = k(4^2+6^2)$$

$$4 = k(16+36)$$

$$4 = k(52)$$

$$\frac{4}{52} = \frac{52k}{52}$$

$$\frac{1}{13} = k$$

$$z = \frac{1}{3}(x^2+y^2)$$ answer

§3.1 functions

(20) & (22) Determine if the Equation represents a function.

(a) $7x^2 + 6y^2 = 1$

$-7x^2 \quad -7x^2$

$\frac{6y^2}{6} = \frac{1-7x^2}{6}$

$y^2 = \frac{1-7x^2}{6}$ Sq Rt prop.

Sq Rt prop

$x^2 = c$

$x = \pm\sqrt{c}$

$y = \pm\sqrt{\frac{1-7x^2}{6}}$ Because y has two values

NOT A function ← Answer

If $x = 0$, ← one Real input, then

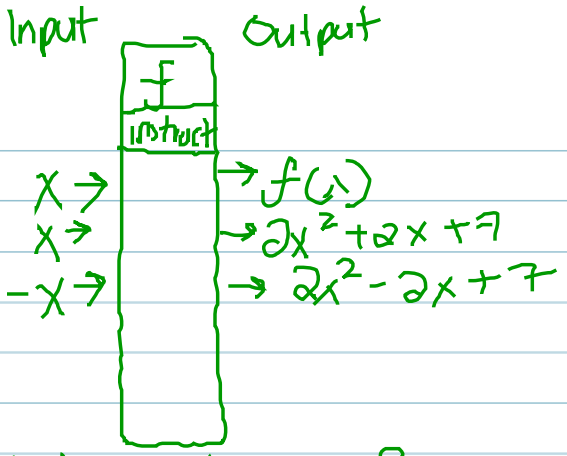
$y = \pm\sqrt{\frac{1}{6}}$

$y = \sqrt{\frac{1}{6}}$ or $y = -\sqrt{\frac{1}{6}}$

Two Real outputs

(b) $\frac{xy}{x} = \frac{3}{x}$ Function

$y = \frac{3}{x}$



Evaluating a function

$f(x) = 2x^2 + 2x + 7$

$f(-5)$?

$f(-5) = 2(-5)^2 + 2(-5) + 7$

$= 2(-5)^2 + 2(-5) + 7$

$= 2(25) - 10 + 7$

$= 50 - 10 + 7$

$= 47$

(b) $f(-x)$?

$f(-x) = 2(\quad)^2 + 2(\quad) + 7$

$= 2(-x)^2 + 2(-x) + 7$

$= 2x^2 - 2x + 7$

(c) Find $-f(x)$

$-f(x) = ?$

$= -(2x^2 + 2x + 7)$

$= -2x^2 - 2x - 7$

(d) Find $f(x+h)$

$f(x+h) = 2(\quad)^2 + 2(\quad) + 7$

$= 2(x+h)^2 + 2(x+h) + 7$

$= 2(x+h)(x+h) + 2x + 2h + 7$

$= 2(x^2 + 2hx + h^2) + 2x + 2h + 7$

$= 2x^2 + 4hx + 2h^2 + 2x + 2h + 7$

True or False: $(x+h)^2 = x^2 + h^2$

False

(e) find $\frac{f(x+h)-f(x)}{h}$?

we already solved this

difference quotient

$$= \frac{2x^2+4hx+2h^2+2x+2h+7-(2x^2+2x+7)}{h}$$

$$= \frac{2x^2+4hx+2h^2+2x+2h+7-2x^2-2x-7}{h}$$

$$= \frac{4hx+2h^2+2h}{h}$$

$$= \boxed{4x+2h+2}$$