3-1-2016

FUNCTIONS AND INVERSE FUNCTIONS

EXAMPLE: $y = 2 \cdot x$

IF GIVEN $x = 1$

FIND y: $y = 2$

(USING PEMDAS →)

OTHER DIRECTION:

GIVEN $y = 2$

FIND $x = ?$

(USING ← PEMDAS)

X WAS MULTIPLIED BY 2, SO TO INVERT, IN NEED THE INVERSE OF MULTIPLY (DIVISION)

SO, DIVIDE BY 2.

$$\frac{y}{2} = \frac{2 \cdot x}{2} = x \quad \leftarrow \text{SHOW}$$

SO $x = \frac{y}{2} = \frac{2}{2} = \boxed{1}$

EXAMPLE: $y = x - 3$ $\quad y = 2$

SOLVE FOR THE UNKNOWN x

$$\boxed{2 = x - 3}$$

SUBRATION OF 3 $\Rightarrow$ INVERSE OF SUBTRACTION IS ADDITION

ADD 3 TO BOTH SIDES

$$2 + 3 = x - 3 + 3 \quad \leftarrow \text{SHOW}$$

$$5 = x + 0 = x$$

$$\boxed{x = 5}$$

SHOW INVERSION STEPS

EXAMPLE: $5 = 3x + 2$ SOLVE FOR THE UNKNOWN

PEMDAS ←

$3x$: $\cdot 3$ (2nd TO UNDO)

$+2$ (1ST TO UNDO)

UNDO $+2$ BY -2:

$5 = 3x + 2$

$5 - 2 = 3x + 2 - 2$ ←

$3 = 3x$

UNDO $\cdot 3$ BY $\div 3$:

$\frac{3}{3} = \frac{3x}{3}$ ←

$\boxed{1 = x}$

CHECK:

$5 = 3 \cdot 1 + 2$

$= 3 + 2$

$5 = 5$

EXAMPLE: $12 = \frac{x}{2} - 10$ PEMDAS ←

$\frac{x}{2}$ (2nd) -10 (1st)

$12 = \frac{x}{2} - 10$

$+10 \quad +10$ ←

$22 = \frac{x}{2}$

$2 * 22 = \frac{x}{2} * 2$ ←

$\boxed{44 = x}$

LIST OF FUNCTIONS AND INVERSE PAIRS

$\div$ $\times$

$+$ $-$

$\vdots$

FIND THE UNKNOWN:

PEMDAS

$3 \cdot x / 2 = 6$

METHOD 1: ($\uparrow$ 2nd, $\nwarrow$ 1st)

$3 \cdot x / 2 * 2 = 6 * 2$ ←

$3 \cdot x = 12$

$\frac{3 \cdot x}{3} = \frac{12}{3}$ ←

$\boxed{x = 4}$

METHOD 2: $\frac{3x}{2} = 6$ OR $\frac{3}{2} \cdot x = 6$

$\frac{\frac{3}{2}x}{\frac{3}{2}} = \frac{6}{\frac{3}{2}}$ ←

$\boxed{x = 4}$

METHOD 3: $\frac{2}{3} \cdot \frac{3x}{2} = 6 \cdot \frac{2}{3}$ ←

$\boxed{x = 4}$

TRIGONOMETRY

~~$)($~~ STUDY OF MEASURE OF 3 SIDES

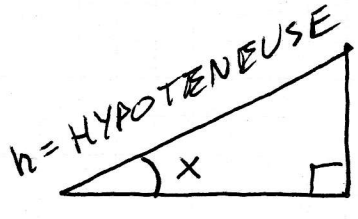
MEMORIZE THESE

$\sin x = \frac{o}{h}$ (sine)

$\cos x = \frac{a}{h}$ (cosine)

$\tan x = \frac{o}{a}$ (tangent)

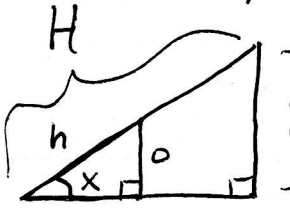
RIGHT TRIANGLES



(GIVEN ON EXAM)

MNEMONIC SOH CAH TOA

SOME OLD HIPPIE CAUGHT ANOTHER HIPPIE TRIPPING ON ACID



$$\frac{o}{h} = \frac{O}{H}$$

INVERSES OF THE TREG. FUNCTION

$y = \sin x$	$x = \sin^{-1} y$	(OR $x = \arcsin y$ $= a\sin y$)
$y = \cos x$	$x = \cos^{-1} y$	
$y = \tan x$	$x = \tan^{-1} y$	

EXAMPLE

$$y = \sin(30^\circ)$$
$$= 0.5$$

MAKE SURE CALC. IS IN 'DEGREE' MODE

TREG.
PEMDAS

INVERTING: $0.5 = \sin(x)$

APPLY $\sin^{-1}$ TO BOTH SIDES

$$\sin^{-1}(0.5) = \sin^{-1}(\sin(x)) \leftarrow$$

$$\boxed{30^\circ = X}$$