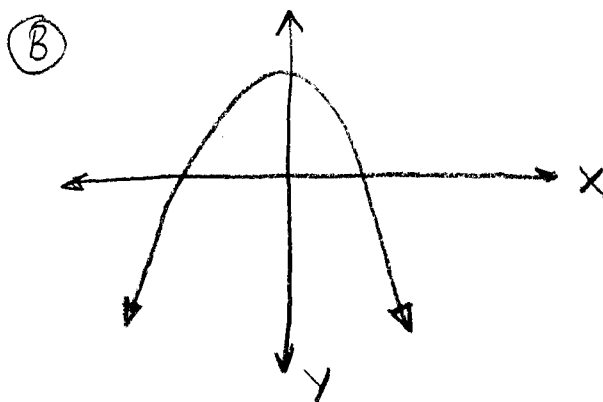
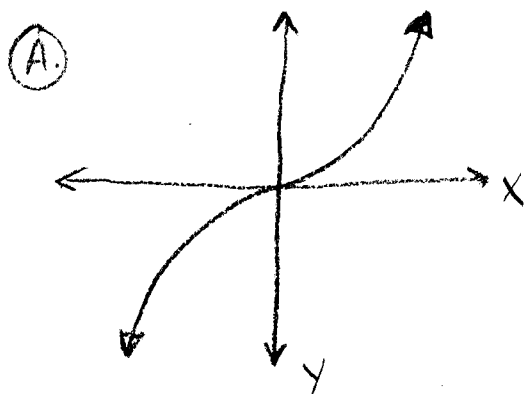


BE-Alg 2 / TUESDAY 11-23-10

① Which function has an inverse which is also a function? THAT is, which function is a ONE-to-ONE function?



THESE EXAMPLES ARE ON PAGE 392

Homework review: Pg. 393 # 8-11.

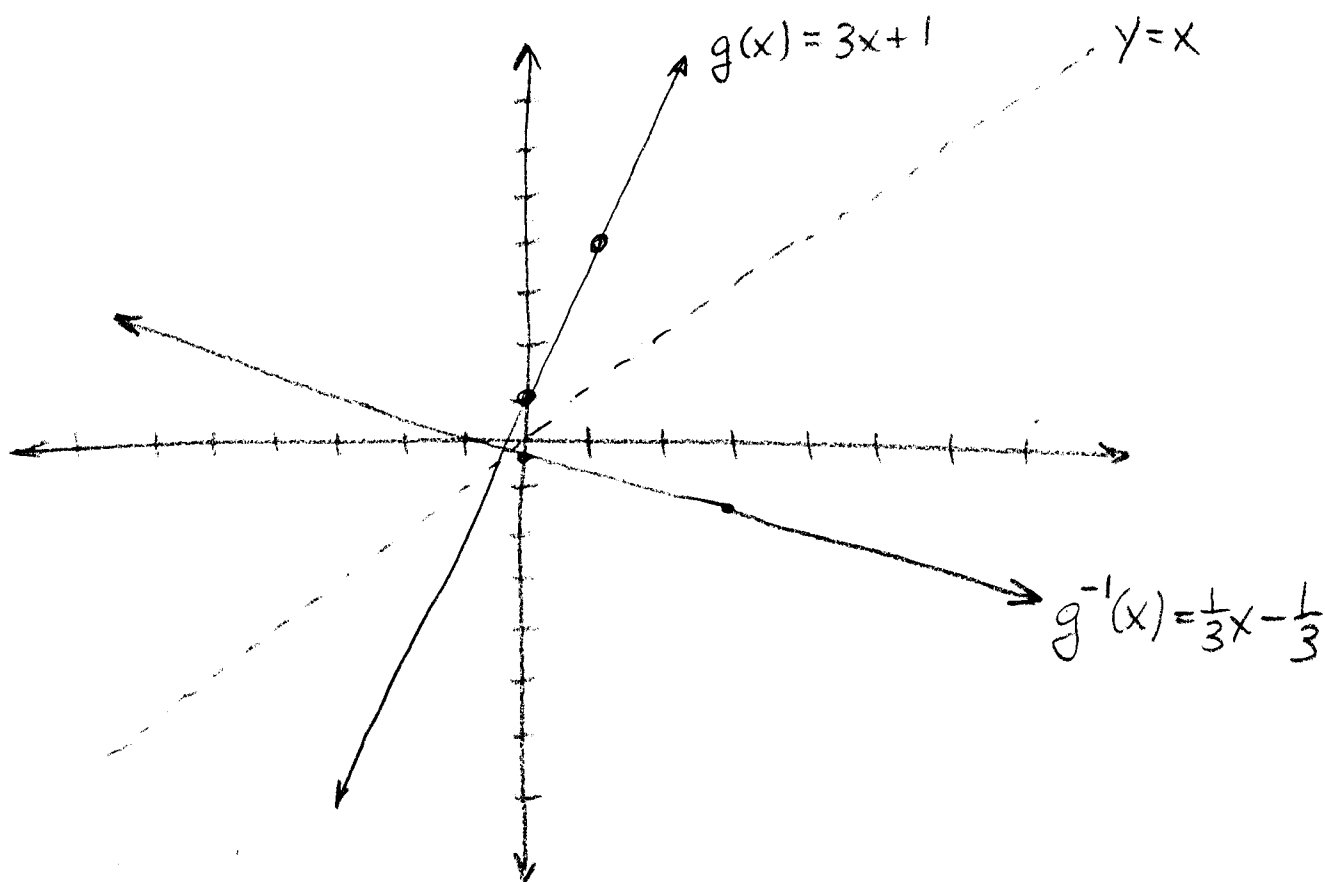
⑧ $g(x) = 3x + 1$ Find $g^{-1}(x)$

$$y = 3x + 1 \Rightarrow x = 3\overset{\downarrow}{y} + 1 \quad \text{SWAP } x \leftrightarrow y$$

$$x - 1 = 3y$$

$$\therefore \boxed{y = \frac{x-1}{3} = g^{-1}(x)}$$

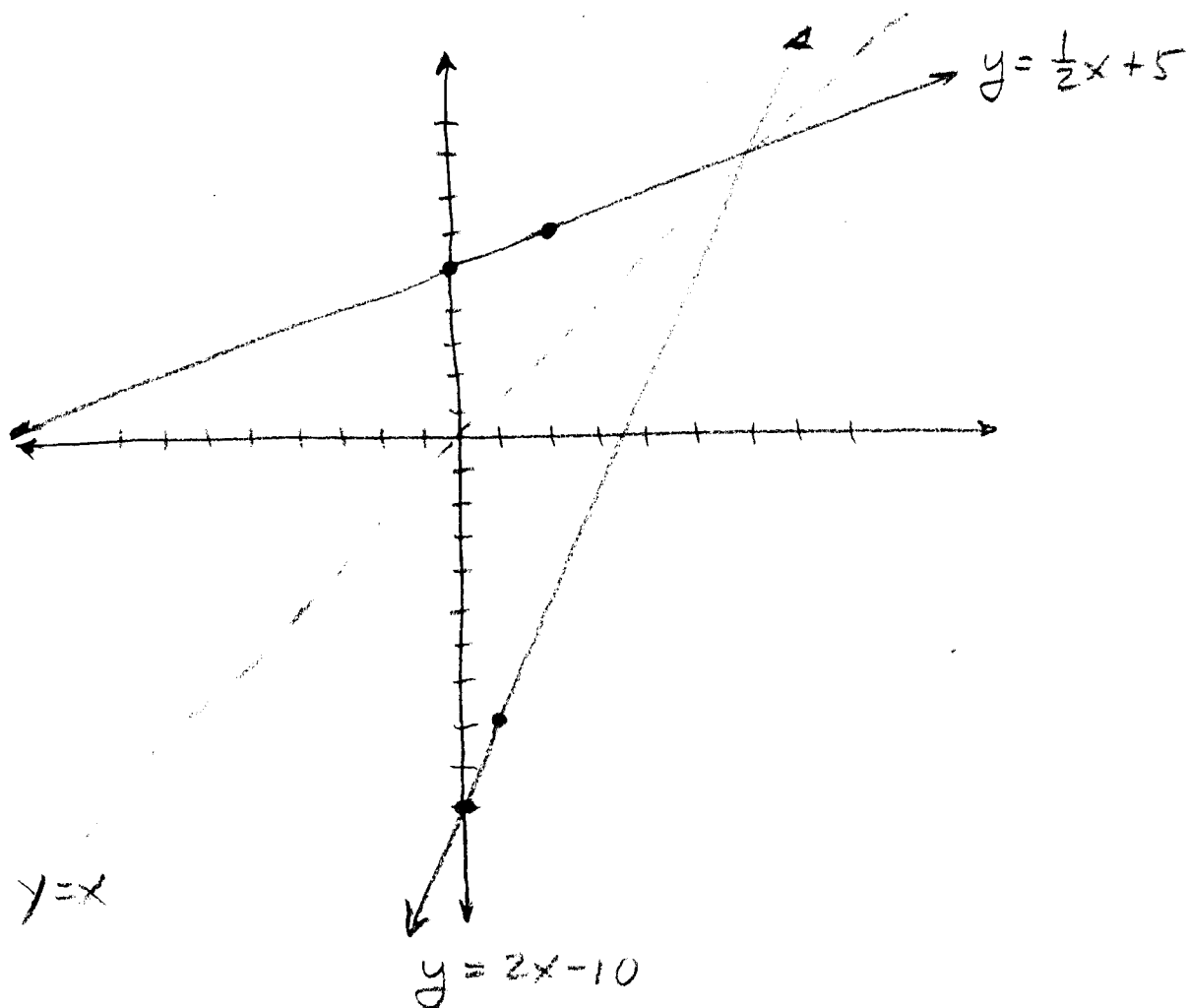
$$\text{or } y = \frac{1}{3}x - \frac{1}{3}$$



⑨ $\boxed{y = \frac{1}{2}x + 5}$ $\Rightarrow$ $x = \frac{1}{2}y + 5$ SWAP $x \leftrightarrow y$

$$2(x-5) = \frac{1}{2}y \cdot 2$$

$$\boxed{2x - 10 = y = f'(x)}$$



$$\textcircled{10} \quad f(x) = x + 7$$

$$g(x) = x - 7$$

$$(f \circ g)(x)$$

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

$$\begin{aligned} f(x-7) &= (x-7) + 7 \\ &= x \checkmark \end{aligned}$$

$$(g \circ f)(x)$$

$$g(x) = x - 7$$

$$\begin{aligned} g(x+7) &= (x+7) - 7 \\ &= x \checkmark \end{aligned}$$

[YES, THEY ARE INVERSE FUNCTIONS]

$$\textcircled{11} \quad g(x) = 3x - 2$$

$$f(x) = \frac{x-2}{3}$$

$$(g \circ f)(x)$$

$$g(x) = 3x - 2$$

$$g\left(\frac{x-2}{3}\right) = 3\left(\frac{x-2}{3}\right) - 2$$

$$= x - 2 - 2$$

$$= x - 4$$

↗

NOT X

$$(f \circ g)(x)$$

$$f(x) = \frac{x-2}{3}$$

$$f(3x-2) = \frac{(3x-2)-2}{3}$$

$$= \frac{3x-4}{3}$$

$$= x - \frac{4}{3}$$

↗

NOT X

[NO, NOT INVERSE FUNCTIONS]

Look At Problems 38-40 on Pg 394

Pick number between 1-20 $\Rightarrow$ say x

Add 7 $\Rightarrow x + 7$

MULT. BY 4 $\Rightarrow 4(x + 7)$

Minus 6 $\Rightarrow 4(x + 7) - 6$

$$\div \text{ by } 2 \Rightarrow \boxed{\frac{4(x+7)-6}{2} = y} \quad \text{Result} = 35$$

Find inverse $\Rightarrow \frac{4(y+7)-6}{2} = x$
 $\Rightarrow y^{-1}$

$$\frac{4y + 28 - 6}{2} = x$$

$$2y + 11 = x$$

$$\boxed{y^{-1} = \frac{x - 11}{2}}$$

Use result in y^{-1}
to find original
number

$$y = \frac{35 - 11}{2} = \frac{24}{2} = \boxed{12}$$

↑
ORIGINAL
number