

15 Domain of $g(x) = \frac{8}{x}$ is $\{x | x \neq 0\}$

$$(f \circ g)(x) = f(g(x)) = \frac{8}{\frac{8}{x} + 8} = \frac{8}{\frac{8+8x}{x}} = \frac{8x}{8+8x}$$

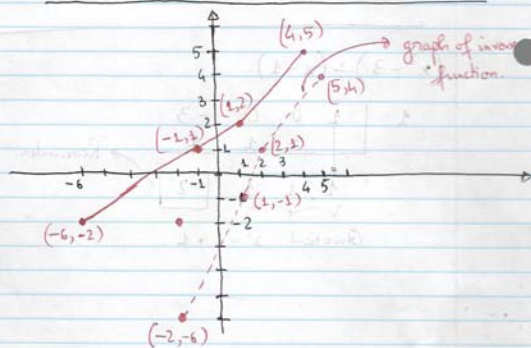
Find domain of $f(g(x))$: $8+8x=0 \rightarrow 8x=-8$
 $\rightarrow x=-1$

So, domain of $f(g(x))$ is $\{x | x \neq -1\}$

So, domain of $f \circ g$ is $\{x | x \neq -1 \text{ and } x \neq 0\}$

In interval notation: $(-\infty, -1) \cup (-1, 0) \cup (0, \infty)$

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17 $h(t) = -16t^2 + 64t + 21$

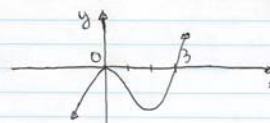
This is a quadratic function with $a = -16 < 0$.

So, it has a maximum value which occurs at $t = -\frac{b}{2a}$.

$a = -16, b = 64$, So, $-\frac{b}{2a} = \frac{-64}{-32} = 2$.

The maximum value is $h(2) = -16(2)^2 + 64(2) + 21$
 $= 85 \text{ (ft)}$

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Touches x -axis at 0 $\rightarrow$ has $(x)^2$ factor

Cross x -axis at 3 $\rightarrow$ has $x-3$ factor.

Falls to left, rises to right $\rightarrow$ positive leading coefficient.

So, $f(x) = x^2 \cdot (x-3) = x^3 - 3x^2$

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$$x^2 + y^2 + 4x + 10y = 7$$

$$x^2 + 4x + 4 + y^2 + 10y + 25 = 7 + 4 + 25$$

$$(x+2)^2 + (y+5)^2 = 36$$

Center of circle: $(-2, -5)$

Radius of circle: 6

