Composition Functions

$f(x) = 3x+2$; $g(x) = -x-5$; $h(x) = 2x+4$

① $f(2) = 3(2)+2 = 6+2 = \boxed{8}$

② $g(h(-1))$ =
$h(-1) = 2(-1)+4 = -2+4 = 2$
$g(2) = -(2)-5 = -2-5 = \boxed{-7}$

③ $h(g(f(3)))$ =
$f(3) = 3(3)+2 = 9+2 = 11$
$g(11) = -(11)-5 = -16$
$h(-16) = 2(-16)+4 = -32+4 = \boxed{-28}$

④ $h(f(x))$ =
$h(3x+2) = 2(3x+2)+4$
$= 6x+4+4$
$= \boxed{6x+8}$

⑤ $h(g(f(x)))$:
$g(3x+2) = -(3x+2)-5 = -3x-2-5 = -3x-7$
$h(-3x-7) = 2(-3x-7)+4 = -6x-14+4$
$= \boxed{-6x-10}$

⑥ $f(g(h(x))) = -43$ Find x.
$g(2x+4) = -(2x+4)-5 = -2x-4-5 = -2x-9$
$f(-2x-9) = 3(-2x-9)+2 = -6x-27+2$
$= -6x-25$

$-6x-25 = 43$
$\frac{-6x}{-6} = \frac{-18}{-6}$
$\boxed{x=3}$ $\{(3, -43)\}$