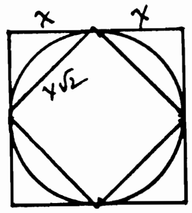
5-1)



$\frac{\text{area of circumsquare}}{\text{area of insquare}} = \left(\frac{2x}{x\sqrt{2}}\right)^2 = \frac{4}{2} = \frac{2}{1}$, so

the area of the circumscribed square $= 2(60) = \boxed{120}$.

5-2) $\log_x \sqrt{x+12} > 1$ First, since the base is x, $0 < x$, $x \neq 1$.

If $x > 1$, then $\sqrt{x+12} > x$

$x+12 > x^2$

$x^2 - x - 12 < 0$

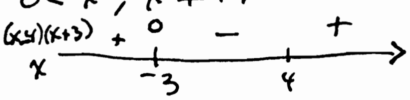
$(x-4)(x+3) < 0$

If $0 < x < 1$, $\sqrt{x+12} < x$

⋮

$x^2 - x - 12 > 0$

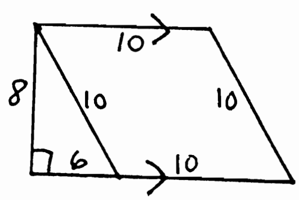
no solutions



$\boxed{\{x \mid 1 < x < 4\}}$ or $(1, 4)$

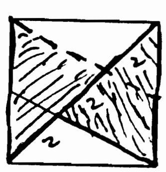
5-3) $0! = 1$ $1! = 1$ $2! = 2$ $3! = 6$ $4! = 24$ $5! = 120$. Whatever we multiply by now, the units' digit remains 0. So the sum has the same units' digit as $0! + 1! + 2! + 3! + 4! = 34$ whose units' digit is $\boxed{4}$.

5-4)



$\text{Area} = \frac{h}{2}(b_1 + b_2) = 4(26) = \boxed{104}$.

5-5)



Using the two shaded △s and their midlines (aka bimedians) the length of the square's diagonal is 6, so its area $= \frac{d^2}{2} = \frac{6^2}{2} = \boxed{18}$.

5-6) $\sqrt{5x} - \sqrt{2x} = 5 - 2 \Rightarrow \sqrt{x}\left(\sqrt{5} - \sqrt{2}\right) = 5 - 2 = (\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2})$

Dividing, $\sqrt{x} = \sqrt{5} + \sqrt{2}$, so

$x = 5 + 2\sqrt{10} + 2 = \boxed{7 + 2\sqrt{10}}$.