Worked w/ Alex, Austin, + River

At the current market equilibrium, price is $17 and quantity is 50. A tax of 25% is imposed, after which the price paid by consumers including the tax is $20 and the new equilibrium quantity is 40. Sketch a figure illustrating the equilibrium before and after the tax. Calculate tax revenue the producer burden, the consumer burden, and the excess burden. Label each.
Hint: If τ is the tax rate, the price paid by consumers is (1+τ) times the price received by suppliers once the tax is remitted to the government.

$P = 17 \qquad Q = 50 \qquad t = 25\%$

$P + t = 20 \qquad Q + t = 40$
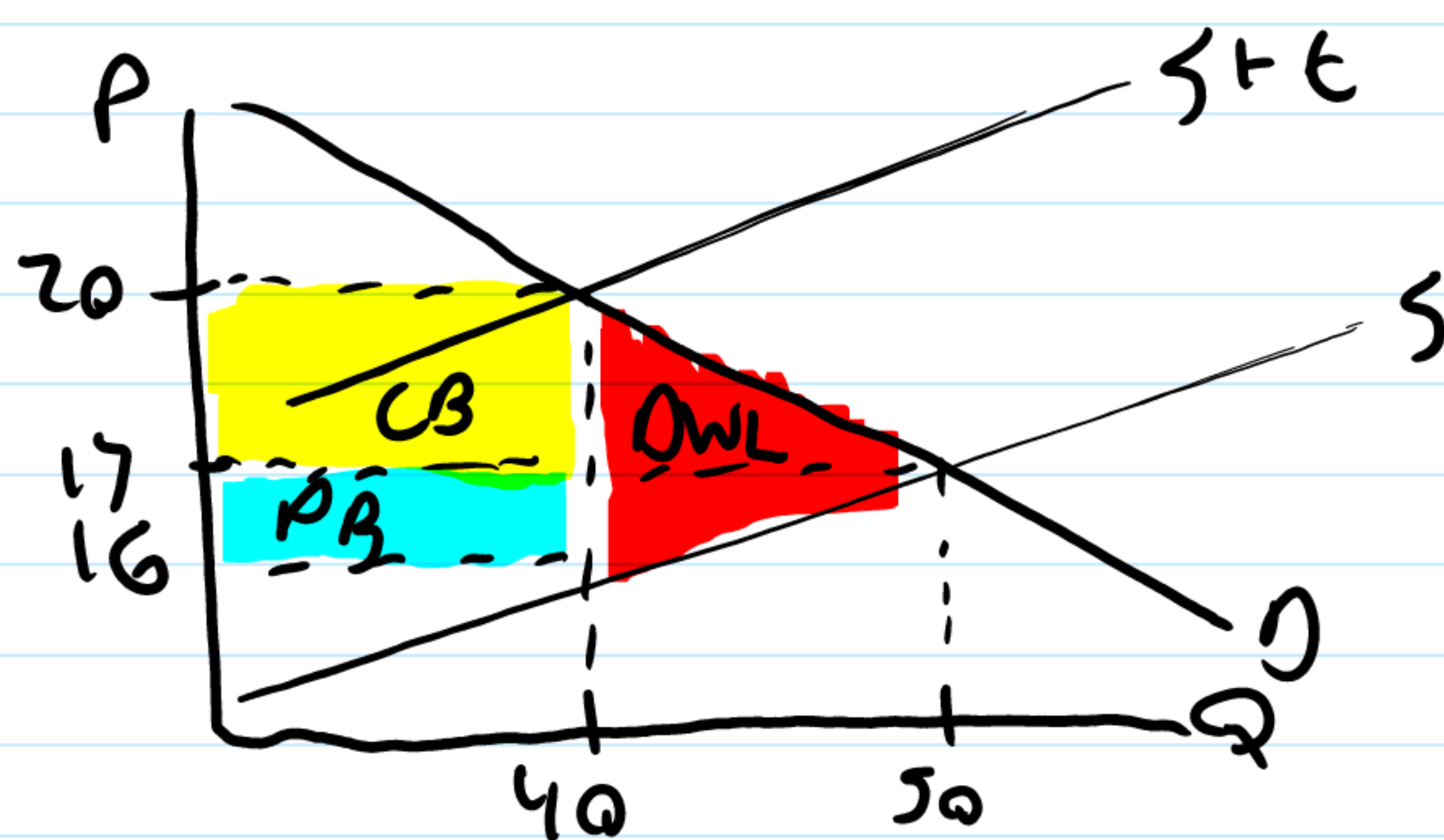
Tax revenue: $(20 - 16) \cdot 40 = 4 \cdot 40 = \$160$

Producer burden: $(40 - 0) \cdot (17 - 16) = 40 \cdot 1 = \$40$

$\begin{array}{ll} P_p = 15.25 & Q_p = 40 \\ P_e = 17 & Q_e = 50 \\ P_c = 20 & Q_c = 40 \end{array}$

consumer burden: $(20 - 17) \cdot (40 - 0) = 3 \cdot 40 = \$120$

$DWL: \frac{1}{2}(50 - 40)(17 - 16) + \frac{1}{2}(50 - 40)(20 - 17) = \frac{1}{2}(10)(1) + \frac{1}{2}(10)(3)$

$\qquad\qquad = 5 + 15 = 20$