6. The equivalent resistance of two resistors connected in parallel is found by using the reciprocal relationship

$$1 / R_p = 1 / R_1 + 1 / R_2$$

$$1 / R_p = 1 / (20\Omega) + 1 / (20\Omega)$$

$$1 / R_p = (0.05 + 0.05) \ \Omega^{-1}$$

$$1 / R_p = (0.10) \ \Omega^{-1}$$

We now take the reciprocal of both sides to obtain $R_p = (1 / 0.1) \ \Omega = 10 \ \Omega$

Note that the calculated equivalent parallel resistance of 10 Ω is smaller than each of the 20 Ω resistors in the original parallel combination. Also, this example presents a special case wherein the equivalent resistance for two equal resistances connected in parallel is equal to one half of either of the original resistors. This result holds **only** for the case of two **equal** resistances connected in parallel.