Year 13 Science: A physics issue: how should New Zealand make its electricity?

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. The wind speed rises from 5 m s^{-1} to 10 m s^{-1}. By what factor does the power in the wind change?

2. Find the power in the wind through a turbine with 40.0 m blades in a 12.0 m s^{-1} wind, using $\rho = 1.20$ kg m^{-3}.

3. A line with resistance 5.00 Ω carries 400 A. Find the power lost as heat.

4. The same power is sent at twice the voltage. Find the new power lost.

5. Use the 2024 table to find hydro's share of New Zealand's electricity.

Fix the mistake

6. Correct this statement: "Wind is free, so doubling the number of turbines doubles our electricity whatever the weather."

7. Correct this statement: "My position is that renewables are good, and my action is to tell people to use less power."

8. Correct this statement: "This website says wind farms are unreliable, so they are."

9. Correct this statement: "Transmission loss is $P = V^2/R$ with the line's full voltage, so higher voltage loses more."