202: Principles of electrical science  
**Worksheet 6: Power**

**Answer guide**

1. The voltage drop in a cable carrying 10.5 amperes is 4.6 volts. Calculate the power wasted in the cable.

48.3W

1. A d.c. machine takes 18.6 amperes from a 220 volt supply. Calculate the machine’s input power.

4,092W (4.092kW)

1. Complete the following table.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P** | 360 | 6,000 | 500 | 37.5 | 3,000 | 1,000 | 6,000 | 750 | 1,000 |
| **I** | 3 | 12 | 75 | 0.25 | 13.63 | 13.5 | 25 | 6.82 | 10 |
| **V** | 120 | 500 | 6.67 | 150 | 220 | 74.07 | 240 | 110 | 100 |

1. Calculate the voltage drop in a resistor, when the power absorbed is 9kW and the current flowing is 63 amperes.

142.85 volts

1. An appliance is rated at 3kW 240 volts. Calculate the current drawn from the supply.

12.5 amps

1. Two resistors of 25Ω and 95Ω are connected in series across a 240 volt d.c. supply. Calculate:
   1. the power absorbed by each resistor
   2. the total power drawn from the supply.

100W and 380W

480W

1. Calculate the value of resistor that absorbs 1kW of power when a current of 10 amperes is flowing.

10Ω

1. A joint in a cable has a resistance of 0.0236Ω. Calculate the power developed in the joint when a current of 40 amperes is flowing in the cable.

37.76W

1. Determine what the rating of a 2kΩ resistor should be in watts, if it has to be capable of carrying a current of 30mA.

1.8W

1. Calculate the power loss in a cable of 0.25Ω when a current of 30 amperes is flowing.

225W

1. Three resistors of 1Ω, 0.005kΩ and 500mΩ are connected in series across a 52 volt d.c. supply. Calculate:
   1. the power absorbed by each resistor
   2. the total power supplied to the circuit.

64W, 320W and 32W

416W