A1 Using And Rearranging Equations

A1.1 A. $F=ma$ $\quad \frac{F}{m}=a=\frac{3}{2}=1.5\ ms^{-2}$

B. $Q=It \quad =0.2\times200=40\ C$

A1.2 A. $V=IR \quad \frac{V}{I}=R=\frac{9}{0.03}=300\ \Omega$

A1.3 B. $s=ut=30\times\underbrace{(2\times60)}_{t}=3600\ m$

Because time is given in minutes, which needs to be converted to seconds.

A1.4 $V=fx \quad x=\frac{V}{f}=\frac{3\times10^{8}}{2\times10^{9}}=0.15\ m$

A1.5 $P=IV \quad =0.25\times240=60\ W$

B. $V=IR=5\times2=10\ V$

$P=IV=5\times10=\boxed{50\ W}$ Final answer: 50 W

A1.6 A. $a=\frac{v-u}{t}=\frac{25-15}{8}=1.3\ ms^{-2}$

A1.7 A. $a=\frac{v-u}{t} \quad \frac{v-u}{a}=t=\frac{100-0}{20}=5\ s$

A1.8 $E=Pt \quad \frac{E}{t}=P=\frac{672\,000}{240}=2800\ W$

$P=IV \quad \frac{P}{V}=I=\frac{2800}{240}=11.666\approx11.7\text{A to 2 s.f.}$

A1.9 First calculate acceleration

$$a = \frac{v-u}{t} = \frac{13-0}{5} = 2.6\ ms^{-2}$$

Then use $F=ma$ to calculate F

$F = 750 \times 2.6 = 1950$

≈ 2000 correct to 2 S.f

Final answer = 2000 N

A1.10 First calculate I

$V = IR$

$\frac{V}{R} = I = \frac{240}{60} = 4\ A$

Then calculate P

$P = IR$

$= 240 \times 4$

$= 960\ W$

Then finally ~~calculate~~ calculate E

$E = Pt = 960 \times 600 = 576,000$

$\approx 580,000$ correct to 2 S.f.

Final answer = 580,000 J