b) Calculate the power if 5.0 A flows through a $2.0\ \Omega$ resistor.

A1.6 A Corsa accelerates from 15 m s^{-1} to 25 m s^{-1} in 8.0 s. Calculate the acceleration.

A1.7 If a jet has a maximum acceleration of 20 m s^{-2}, what is the time it would take to get from 0 m s^{-1} to 100 m s^{-1}?

A1.8 My kettle needs to be able to give $672\,000$ J of heat energy to water in 240 s. Assuming that it is connected to the 240 V mains, what current is needed?

A1.9 Calculate the force needed if my 750 kg car needs to accelerate from rest to 13 m s^{-1} in 5.0 s.

A1.10 Calculate the electrical energy used by a 240 V light bulb with a resistance of $60\ \Omega$ in 600 s.

$^{29}/_{38}$

A2 Derived and Base SI Units

Express the following derived units in terms of the SI base units. The first one has been done for you:

	Derived unit	In base units	Power of each base unit			
			m	s	kg	A
	m s^{-2}	m s^{-2}	1	−2	0	0
A2.1	J		(a)	(b)	(c)	(d)
A2.2	N		(a)	(b)	(c)	(d)
A2.3	C		(a)	(b)	(c)	(d)
A2.4	V		(a)	(b)	(c)	(d)
A2.5	Ω		(a)	(b)	(c)	(d)
A2.6	Pa		(a)	(b)	(c)	(d)
A2.7	N C^{-1}		(a)	(b)	(c)	(d)
A2.8	V m^{-1}		(a)	(b)	(c)	(d)

Express the following derived units in terms of the unit specified and base units. The first one has been done for you.

A2.9 a) Express the ohm in terms of the volt and base units: $\Omega = \text{V A}^{-1}$

b) Express the joule in terms of the newton and base unit(s).

c) Express the pascal in terms of the joule and base unit(s).

d) The answer to (c) means that pressure in effect measures an amount of energy per unit _____

e) Express the V m^{-1} in terms of the joule and base unit(s).

f) Express the unit of density in newtons and base unit(s).

A3 Standard Form and Prefixes

$^{9}/_{12}$

You will be penalized if you give the wrong number of significant figures where the question specifies the required number of significant figures. [NOTE: standard form means that there is always one non-zero digit before the decimal point.]

A3.1 Write the following as 'normal' numbers:

a) 3×10^4 b) 4.89×10^6

A3.2 Write the following as 'normal' numbers:

a) 3.21×10^{-3} b) 2×10^0

A3.3 Write the following in standard form to three significant figures:

a) $2\,000\,000$ b) $34\,580$

A3.4 Write the following in standard form to three significant figures:

a) 23.914 b) $0.000\,005\,638$

A3.5 Write the following as 'normal' numbers with the unit (but without the prefix):

a) 3 kJ b) 20 mA

A3.6 Write the following using the most appropriate prefixes:

a) 5×10^7 m b) 6×10^{-10} s