

Try not to make the homework more difficult than it is.

- The written solutions should be complete *but concise*.
- Do not hand in scratch paper. Do the calculation on scratch paper, but hand in a concise statement of the results.
- If a calculation was done in class, or in Jackson, you are not required to show it in your solution. (*If you want to do the calculation yourself to make sure you understand it, that is a good idea! But you don't need to write it up in the solution.*)
- For linear algebra, use Mathematica or some other computer software. That should be easier *and more accurate* than working out the calculation by hand.

For example, Problem 2-3 (Jackson problem 4.8):

```
In[411]:= boundaryconditions = {
  c0 == c1 + c2 / a^2,
  c1 + c2 / b^2 == -E0 + c3 / b^2,
  c0 == K (c1 - c2 / a^2),
  K (c1 - c2 / b^2) == -E0 - c3 / b^2};
Solve[boundaryconditions, {c0, c1, c2, c3}]
```

```
Out[412]= {{c0 -> - (4 b^2 E0 K) / (-a^2 + b^2 + 2 a^2 K + 2 b^2 K - a^2 K^2 + b^2 K^2),
  c1 -> - (2 b^2 E0 (1 + K)) / (-a^2 + b^2 + 2 a^2 K + 2 b^2 K - a^2 K^2 + b^2 K^2), c2 -> (2 a^2 b^2 E0 (-1 + K)) / (a^2 - b^2 - 2 a^2 K - 2 b^2 K + a^2 K^2 - b^2 K^2),
  c3 -> - (a^2 b^2 E0 + b^4 E0 + a^2 b^2 E0 K^2 - b^4 E0 K^2) / (-a^2 + b^2 + 2 a^2 K + 2 b^2 K - a^2 K^2 + b^2 K^2)}}
```

- For calculus, use Mathematica or some other computer software. That should be easier *and more accurate* than working out the calculation by hand.

For example, Problem 3-7:

```
In[414]:= A = Integrate[Power[1 - m * Sin[x]^2, -1/2], x]
answer = (A /. x -> Pi/2) - (A /. x -> 0)
```

```
Out[414]= EllipticF[x, m]
```

```
Out[415]= EllipticK[m]
```

- For graphics, learn to use Mathematica or some other computer software. For example, make a plot of $(2/\xi) [K(\xi) - E(\xi)] - K(\xi)$

```
In[428]:= Plot[(2 / \xi) * (EllipticK[\xi] - EllipticE[\xi]) - EllipticK[\xi],
  {\xi, -5, 1.5}, PlotRange -> {{-5, 1.5}, {-1, 1}}, ImageSize -> Small]
```

