Final Exam Synthesis Problems: Answer Key
Match your carbons in your starting material to those in the product...

a. 1. PCC  2. CH₃MgBr  3. PCC  4. CH₃CH₂MgBr
or oxidize to c. acid, turn into acid chloride, add one alkyl group via a cuprate and
the other via a Grignard... More than one right answer...

CH₃CH₂CH₂MgBr  8. PCC

c. 1. BH₃  2. NaOH, H₂O₂  3. PBr₃  4. (Ph)₂CuLi

d. 1. PhMgBr  2. POCl₃, pyridine  3. H₂ Pd/C  (or use PCC after the Grignard, and
then use a Wolff Kischner type reduction)

e. Can’t add that phenyl group using enolate chemistry as a phenyl group. Can add it
as a benzyl group though.  1. NaOEt, EtOH  2. CH₃I  3. NaOEt, EtOH,  4. PhCH₂Br

f. 1. NaOEt, EtOH  2. PhCH₂CH₂Br  3. H₃O⁺, heat  4. BPr₃  5. (Ph)₂CuLi  6. NH₂NH₂, KOH
or Zn(Hg), H₃O⁺.

g. 1. 2,2-dimethylpropanoyl chloride, AlCl₃  2. H₂, Pd/C  3. SO₃, H₂SO₄  4. NaOH,
H₂O  5. NaH  6. CH₃I

h. 1. Mg  2. CO₂  3. PBr₃  4. CH₃MgBr  (if you didn’t have the bromine on the ring
already, you’d have more options...)
i. 1. NaOEt, EtOH  2. NH₂NH₂, KOH (or Clemmenson reduction - both will change
the ester to a c. acid - bonus side reaction!)  3. PBr₃  4. (CH₃CH₂CH₂)₂CuLi