Chapter 5.2 Practice Key

1. If I said A $\leq_M$ B and B is undecidable, what does this say about A?

   Nothing. A can be undecidable, Turing recognizable or Turing decidable.

2. If I said A $\leq_M$ B and A is undecidable, what does this say about B?

   B is undecidable too. B cannot be any "harder" or more decidable than A.

3. If I said A $\leq_M$ B and B is decidable, what does this say about A?

   A is decidable.

4. If I said A $\leq_M$ B and A is decidable, what does this say about B?

   Nothing. B can be undecidable, Turing recognizable or Turing decidable.

5. If I said A $\leq$ B and B is undecidable, what does this say about A?

   Nothing. This is not a mapping reduction, just a reduction. More processing will happen in A, so they are not directly related.

6. If I said A $\leq$ B and A is undecidable, what does this say about B?

   Even though this is not a mapping reduction, just a reduction. A still decides the limits of B, so B is undecidable.

7. Discuss what the following means: A $\leq_M$ B and B $\leq_M$ C

   This implies A $\leq_M$ C.