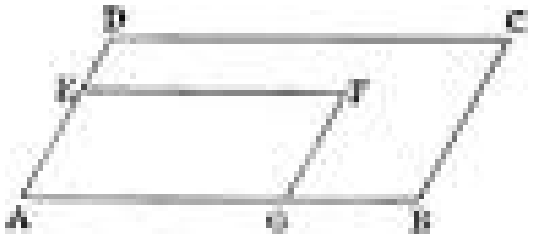
MTH 2160 **REVIEW 3** Fall 2010 Prof. Kirby

1. Write 82 as a sum of distinct Fibonacci numbers.

2. Given that $\phi^9 = 34\phi + 21$, find integers *a* and *b* such that $\phi^{10} = a\phi + b$. Then find numbers *c* and *d* such that $\phi^{10} = c\sqrt{5} + d$.

3. Fact: if you add the square of F_k to the square of F_{k+1} you get F_{2k+1}. (1) Write this fact as an equation. (2) Show that this equation is true for $k = 4$. (3) Given $F_{15} = 610$ and $F_{16} = 987$, what is F_{31}?

4. 

Is the region *BCDEFG* a gnomon of ***A****EFG*? Give a reason.

5. P. 467 # 31.

6. Calculate the next 3 terms of the Mandelbrot sequence with seed $1 + i$. Graph them and predict the behavior of this sequence.

7. Two consecutive terms of a Mandelbrot sequence are 8 and 68. What is the seed?