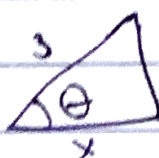


## Math II Sample Questions

1. combinatorics:  $\binom{6}{2} - \binom{8}{4} = \frac{6!}{2!4!} - \frac{8!}{4!4!} = 1050$ , [C]
2. clearly the statement fails for  $x = -\frac{1}{2}$ , [B]
3.  $\log(3x) = \log(x) + \log(3) \approx 2.35$ , [D]
4.  $4000 = k \cdot 3.7$   
 $55 - \frac{4000}{3.75} \approx 5400$ , [C]
5. need  $4 \cdot \frac{3}{2} - k = 0$ , so  $k = 6$ , [E]
6. max when  $160\pi t = \frac{\pi}{2}$ ,  $\frac{5\pi}{2}$ , etc., which happens  $\frac{160}{2} = 80$  times, [B]
7. looks quadratic and by plugging in, [E] works
8. f-g needs  $x \leq 5$  and  $x \geq -4$ , [C]
9. the difference is  
 $10,000 - [(1.05)^4 - (1.1)^2] \approx 55$ , [A]
10. only  $x+y^3$  has odd powers for both, [D]
11. it's a square; by Pythagoras side length is  $5\sqrt{2} \Rightarrow$  [C]
12. double  $h$  and  $r$  (as they're similar)  $\Rightarrow$  increases  $\frac{1}{3}\pi r^2 h$  to  $\frac{1}{3}\pi(2r)^2 \cdot 2h$ , or 8 times bigger, [A]
13. law of sines:  $\frac{x}{\sin(40^\circ)} = \frac{5}{\sin(100^\circ)}$ ,  $x \approx 3.77$ , [D]
14.   $\sqrt{9-x^2} \Rightarrow \sin(\theta) = \frac{\sqrt{9-x^2}}{3}$ , [A]
15. regress on TI or Mathematica  $\Rightarrow$  [D]