

## 46th MMPC Part I

Wednesday, October 9, 2002

- 1) c  $-4/w^{(8/3)}$   
 2) e  $A=5p/2-25$   
 3) b  $15/2$   
 4) d  $-200/3$   
 5) c  $(4.1, -1.9)$   
 6) a  $4\sqrt{2}$   
 7) e  $1/(2+\sqrt{5})$   
 8) d  $x < -1300$  and  $y < -1300$   
 9) b  $16$   
 10) c  $400/(800/7-400/6)$  m/s  
 11) a  $0$   
 12) d  $10^2$   
 13) d  $3721$   
 14) d  $71$   
 15) a  $a$   
 16) c  $97$  degrees  $22$  minutes  
 17) e None of the above.  
 18) e  $\pi-2$   
 19) c  $x < -3$  or  $-2 < x < -1$   
 20) a  $2003/2002$   
 21) a d  $C=A+B$  and  $C^2 > A^2+B^2$  are both correct.  
 22) b  $3.29$   
 23) d  $|x| > 3/2$   
 24) b  $3,999,960$   
 25) c  $24.375$   
 26) e None of the above.  
 27) e  $243$   
 28) b  $1/3$   
 29) c  $ac$   
 30) e  $320$   
 31) a  $7x(10-x)/10$   
 32) c  $33$   
 33) b  $4\pi$   
 34) c  $(-1, 2)$   
 35) e None of the above.  
 36) d  $26.79$   
 37) b  $4$   
 38) a  $1/4$   
 39) a  $-1999$   
 40) d an ellipse
- 8) Hint:  $x^3 - y^3 = (x-y)(x^2 + xy + y^2) = 0.0002(x^2 + xy + y^2)$ ,  
 so we want a condition that will imply  $x^2 + xy + y^2 > 5,000,000$ .  
 Condition d will do this.)
- 13) Hint: all numbers are perfect squares.  
 14) Hint: how many are divisible by 3 and 8?  
 16) Hint: law of cosines  
 26) Hint: the roots of  $p$  are  $i$  and  $-i$ . We want  $q$  to have those roots, too.  
 29) Hint: Draw the angle bisector of  $B$ . Let  $D$  be where this bisector  
 intersects  $AC$ . Let  $d$  be the length of  $BD$ . Then we have  
 similar triangles.