MATH 205 Winter 2005
ANSWERS TO REVIEW

1. A proof, done in lectures and in the April 20 Review
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3. All are rational numbers except π, $\sqrt{8}$, 6.3030030003....
4. MAPLE - no comments needed
5. Historical - Use History Module as basic reference
6. Next numbers are : 20 (base 6 sequence)), 22 (base 7 sequence), 99 $(= 2 \times 41 + 17)$, 2 (π)
7. 5314, 23324
8. 9, 10, 2, 4
9. Writing horizontally instead of vertically • ••• ••• •
10. 59611
11. $256455_{(8)}$, $15d2d_{(16)}$
12. $\mathbb{Q}$, $\mathbb{R}$, $\mathbb{C}$, $\mathbb{Z}/2$ (same as $\mathbb{Z}_2$), $\mathbb{Z}/3$ (same as $\mathbb{Z}_3$).
13. 13
14. Only solution is $x = 8$, $y = 11$
15. 1
16. First equation : solution is $x = -1/15$, can omit the quadratics
17. The first is a line with y-intercept 6, x-intercept 2. The second is a parabola with x-intercepts -5, 2, and y-intercept -10.
18. Can omit this one
19. Taking $x = -2$ gives a counterexample. Explanation was given in Review.
20. Can omit
21. $P(A') = 1 - .7 = .3$ (here $A' = A^c$, the complementary event to A)
22. $4/36 = 1/9$
23. (a) 4/16=1/4 (b) 1 - (1/16) = 15/16

24. (a) $E = 18$ (b) Yes (c) No

25. Euler path should start at A and end at C (or vice versa), many solutions are possible. There are also many Hamilton cycles, one such is $AECFDBA$.

26. (a) This will be true for all primes p, in fact it is Fermat's Theorem.

    (b) This is false whenever n is not prime, a couple of trials will soon yield a counterexample (e.g. let $n = 4,\ x = 2$).

27. In order : Mt. McKinley (Alaska, USA), Mt. Logan (Yukon, Canada), Pico de Orizaba (Mexico)

    From the questions on p.2 we will only give the solution to Question 5 here (all were done at the Review)

28. (p.2 - 5) The graph meets the x-axis at $x = -2, 0, 3$, so at three points (roots). Sketch not given here. Not every cubic meets the x-axis three times, one time and two times are also possible, and these are the only possibilities.