ANSWERS to Dr. Poage’s Review for MATH 1350 Exam 1

1. 3, 4, 5, or 6

2. (a) contrapositive: If you do not go to Hogwarts, then you do not do magic.
(b) inverse: If you can not do magic, you do not go to Hogwarts
(c) converse: If you go to Hogwarts, then you can do magic.

3. \((\bar{A} \cap B) \cup C\) (venn diagram)

4. (a) no (b) yes (c) no (d) yes (e) no

5. (a) 30, 34, 38 (arithmetic)
(b) 6, 9, 15 (other: recursive)
(c) 45184, 31104, 186624 (geometric)
(d) 125, 216, 343 (other)
(e) 17, 20, 23 (arithmetic)
(f) 48, -96, 192 (geometric)

6. (a) \(a_n = 10 + 4n\)
(b) \(a_n = a_{n-1} + a_{n-2}\)
(c) \(a_n = 4(6)^{n-1}\)
(d) \(a_n = n^3\)
(e) \(a_n = 2 + 3n\)
(f) \(a_n = 3(-2)^{n-1}\)

7. 21 posts

8. 33 people

9. It is both arithmetic (adding 0 each time) AND geometric (multiplying by 1 each time)

10. 1, 2, 10, 11, 12, 20, 21, 22, 100, 101, 102, 110, 111, 112, 120

11. (a) \(a_n = n^2\) (b) \(a_n = 4 + 4n\)

12. (a) If they come, you will build it.
    (b) If you do not build it, they will not come.

13. (a) No students use backpacks.
    (b) “Some of my flowers are blooming.” OR “At least one of my flowers is blooming.”
    (c) “Some of my pencils are not broken.” or “At least one of my pencils is not broken.”
    or “Not all of my pencils are broken.”

14. (a) FALSE (b) TRUE (c) TRUE (d) FALSE (e) FALSE

15. 2300

16. (a) \(64_{\text{twelve}}\) (b) \(100010_{\text{two}}\) (c) \(21301_{\text{four}}\) (d) \(34443_{\text{five}}\)
17. CDXXXVI
18. VICCCLXXXII
19. 4
20. 5
21. (a) 10,100  (b) 8208
22. (a) 430,509  
(b) 319  
(c) 1,708  
(d) 13  
(e) 116  
(f) 1,448  
(g) 2,593  
(h) 50,477
23. 1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23 
24. Yes. Cut off 10 cm, leaving 80 cm. Next cut off 20 cm leaving 60 cm.
25. (a) yes  (b) no  (c) yes  (d) yes  (e) no
26. (a) 101  (b) 1,451
27. 326
28. (a) If you sweat, then you exercise.  
(b) If you do not sweat, then you do not exercise  
(c) If you do not exercise, then you do not sweat.
29. (a) $B = \{x | x \text{ is wearing blue today}\}$  (b) $K = \{x | x \leq 7, x \in N\}$
30. Subsets = $2^9$ or 512. Proper subsets = 511.
31. (a) FALSE  
(b) TRUE  
(c) TRUE  
(d) FALSE  
(e) TRUE  
(f) FALSE
32. (a) $3212_{\text{five}}$  (b) $246_{\text{seven}}$
33. Base 12 is used in measuring Gross/Dozen/Units. Base 60 is used for Hours/Minutes/Seconds.
34. $n(A \cup B) = 7$
35. CCCLXI
36. approximately $8.33

37. (a) TRUE  
(b) FALSE  
(c) FALSE (not proper subset of itself)  
(d) FALSE

38. (a) 30  
(b) \(a_n = n^2 + n\)  
(c) 15,750

39. \(n(A) = 12\)

40. (a) Katie was not late for class today.  
(b) None of the cadets fell asleep in class.  
(c) Some of my students go to Northgate. OR At least one of my students go to Northgate.  
(d) Not all of the lights or turned on. OR At least one of the lights is turned off.

41. \(A \cup (B^c \cap C)\)

42. (a) 21, (b) 193, (c) 81

43. see venn diagrams

44. (a) 32_{\text{four}}  
(b) 12_{\text{twelve}}  
(c) 1110_{\text{two}}  
(d) 24_{\text{five}}

45. 39

46. $1.19 (1 \text{ half dollar}, 1 \text{ quarter}, 4 \text{ dimes}, 4 \text{ pennies})

47. see venn diagram
48. (a) “Some of the cookies are NOT burnt.” OR “Not all of the cookies are burnt” OR “At least one cookies is NOT burnt.”
   (b) “None of the packages have been opened.”
   (c) “Some of my students are sick.” or “At least one of my students are sick.”

49. 364

50. (a) 32   (b) 407   (c) $a_n = 2 + 3n$