1. (A) Either (3,2) or (3,1), which is not an answer choice, must be removed so that 3 will be paired with only one number.

2. (E) For each value of x there is only one value for y in each case. Therefore, f, g, and h are all functions.

3. (C) Since division by zero is forbidden, x cannot equal 2.

1. (E) f(–2) = 3(–2)2 – 2(–2) + 4 = 20.

2. (D) g(2) = 32 = 9. f(g(2)) = f(9) = 31.

3. (C) To get from f(x) to f(g(x)), x2 must become 4x2. Therefore, the answer must contain 2x since (2x)2 = 4x2.

4. (D) g(x) cannot equal 0. Therefore, .

5. (A) Since f(2) implies that x = 2, g(f(2)) = 2. Therefore, g(f(2)) = 3(f(2)) + 2 = 2. Therefore, f(2) = 0.

6. (C) p(a) = 0 implies 4a – 6 = 0, so .

7. (E)

1. (E) If y = 2x – 3, the inverse is x = 2y – 3, which is equivalent to .

2. (A) By definition.

3. (B) The inverse is {(2,1),(3,2),(4,3),(1,4),(2,5)}, which is not a function because of (2,1) and (2,5). Therefore, the domain of the original function must lose either 1 or 5.

4. (E) If this line were reflected about the line y = x to get its inverse, the slope would be less than 1 and the y-intercept would be less than zero. The only possibilities are Choices D and E. Choice D can be excluded because since the x-intercept of f(x) is greater than –1, the yintercept of its inverse must be greater than –1.

1. (D) Use the appropriate test for determining whether a relation is even. I. The graph of y = 2 is a horizontal line, which is symmetric about the y-axis, so y = 2 is even. II. Since f(–x) = –x x = f(x) unless x = 0, this function is not even. III. Since (–x)2 + y2 = 1 whenever x2 + y2 = 1, this relation is even.

2. (D) Use the appropriate test for determining whether a relation is odd. I. The graph of y = 2 is a horizontal line, which is not symmetric about the origin, so y = 2 is not odd. II. Since f(–x) = –x = –f(x), this function is odd. III. Since (–x)2 + (–y)2 = 1 whenever x2 + y2 = 1, this relation is odd.

3. (B) The analysis of relation III in the above examples indicates that I and II are both even and odd. Since –x + y 0 when x + y = 0 unless x = 0, III is not even, and is therefore not both even and odd.

4. (C) A is even, B is odd, D is even, and E is odd. C is not even because (–x)3 – 1 = –x3 – 1, which is neither x3 – 1 nor –x3 + 1.