Characteristics of 19 Basic Functions

By using only the graphs, list all functions that have the given characteristics. The number in parentheses is the number of answers that you should have for each.

1. Domain is $(-\infty,+\infty)$, (10)

2. Origin symmetry, (8)

3. Roots are $\ldots -\frac{5\pi}{2},-\frac{3\pi}{2},-\frac{\pi}{2},\frac{\pi}{2},\frac{3\pi}{2},\frac{5\pi}{2},\ldots$ (2)

4. Range is $(-\infty,+\infty)$, (6)

5. Root at the point (1,0), (1)

6. Domain $(-\infty,0)\cup(0,\infty)$, (2)

7. Range $[0,\infty)$, (4)

8. Domain is ¡ ; $x\neq\left\{\ldots -\frac{5\pi}{2},-\frac{3\pi}{2},-\frac{\pi}{2},\frac{\pi}{2},\frac{3\pi}{2},\frac{5\pi}{2},\ldots\right\}$ (2)

9. Y-axis symmetry (7)

10. Range is all integers, $J=\{\ldots -3,-2,-1,0,1,2,3\ldots\}$ (1)

By using only the graphs, list all functions that have the given characteristics. The number in parentheses is the number of answers that you should have for each.

11. No Roots, (5)

12. The root is at the point (0,0), (7)

13. Range is $(0,\infty)$, (2)

14. Roots are at the x-values $\ldots -3\pi,-2\pi,-\pi,0,\pi,2\pi,3\pi,\ldots$ (2)

15. Range is $(-\infty,-1]\cup[1,\infty)$, (2)

16. Roots are $\pm r$, (1)

17. No Symmetry, (4)

18. Domain $(0,\infty)$, (1)

19. Range $[-1,1]$, (2)

20. Domain is ¡ ; $x \neq \mathrm{J}\pi$ where $\mathrm{J}=\{\ldots -3,-2,-1,0,1,2,3\ldots\}$ (2)