In Questions 10 to 15, solve the given equation and indicate the number of values of θ, such that $0 \leqq \theta < 2\pi$, that satisfy the equation. (Choose your answers from the choices given for Question 10.) Refer to Topic 9, Tables 1 and 2, and special note following Table 2.

10. $\sin\theta = \pm\frac{1}{2}\sqrt{3}$

(1) 0 (2) 1 (3) 2 (4) 3 (5) 4 (6) 5 (7) 6 (8) 7

11. $2\sin^2\theta - \sin\theta - 1 = 0$ (*Hint:* Use quadratic equation $(2x^2 - x - 1) = 0$, where $x = \sin\theta$.)

12. $\sin 2\theta + \sin\theta = 0$ (*Hint:* Table 2, (sin 2 α), factor.)

13. $\cos 2\theta + \cos\theta = 0$ (*Hint:* Table 2, (cos 2α) and 11 above.)

14. $\sin 3\theta + \sin\theta = 0$ (*Hint:* Table 2, (sin 3α), factor.)

15. $2\tan\theta\sin\theta - \tan\theta = 0$ (*Hint:* factor.)

16. $\dfrac{\sin 3\alpha - 3\sin\alpha}{\cos 3\alpha + 3\cos\alpha} =$ _____

(1) $-\cot^2\alpha$
(2) $\cot^3\alpha$
(3) $\tan^2\alpha$
(4) $-\tan^3\alpha$

17. $\dfrac{2\tan(\theta/2)}{1+\tan^2(\theta/2)} =$ _____

(1) $\sin\theta$
(2) $\sqrt{1-\cos\theta}$
(3) $\sqrt{1+\cos^2\theta}$
(4) $\sqrt{1+\sin\theta}$
(5) $\sqrt{1+\sin^2\theta}$

18. Find the least positive angle θ that satisfies the equation $\tan(45° + \theta) - 3\tan\theta = 2$.

(1) $0° < \theta < 20°$
(2) $20° < \theta < 40°$
(3) $40° < \theta < 60°$
(4) $60° \leq \theta < 80°$
(5) $80° < \theta < 90°$

19. $2\tan\phi\sin^2(\phi/2) =$ _____

(1) $\tan\phi + \sin\phi$
(2) $\cot\phi - \tan\phi$
(3) $\tan\phi - \sin\phi$
(4) $\cot\phi + \tan\phi$

20. $\sin 6\theta =$ _____

(1) $6\sin^2\theta - 32\sin\cos^3\theta$
(2) $6\sin\theta\cos\theta - 32\sin^3\theta\cos^3\theta$
(3) $21\sin\theta\cos\theta - 16\sin^2\theta\cos^2\theta$
(4) $21\sin^3\theta - 16\sin^2\theta\cos^2\theta$