1. $\dfrac{x^8}{8}+\dfrac{3}{4}x^4-\dfrac{4}{3}x^3+\dfrac{x^2}{2}-x+C$

2. $\dfrac{2}{75}(11\sqrt{11}-1)$

3. $\dfrac{2}{45}(3w+2)^{\frac{5}{2}}-\dfrac{4}{3}(3w+2)^{\frac{3}{2}}+C$

4. $\dfrac{9}{28}(2x+1)^{\frac{7}{3}}-\dfrac{9}{16}(2x+1)^{\frac{4}{3}}+C$

5. 0

6. $\cot\theta+\dfrac{1}{4}\sin^2(4\theta)+C$

7. $\dfrac{2}{\sqrt{3}}-1$

8. $2\pi\left(1-\dfrac{1}{\sqrt{5}}\right)$

9. 94

10. 6

11. 7

12. $g'(x)=\dfrac{28x^6}{\sqrt{1+16x^{14}}}$

13. $f'(r)=\dfrac{(1+\cot^7 r)(-\csc^2 r)}{\cos(\cot r)}$

14. $h'(y)=-\sin y\sqrt{\dfrac{6\cos^2 y+3\cos y-1}{\tan^2(\cos y+1)-\sec(\cos y)}}-\cos y\sqrt{\dfrac{6\sin^2 y+3\sin y-1}{\tan^2(\sin y+1)-\sec(\sin y)}}$

15. $F(x)=-\sin x+2\tan x+\dfrac{x^4}{4}+x+C$

16. $G(t)=\dfrac{t^4}{4}+\dfrac{2}{7}t^7-\sec t+4t+100$

17. $h(x)=\dfrac{1}{12}x^4+\dfrac{1}{3}x^3+\cos x+2x-4$

18. Use the fact that $-1\le\cos x\le 1$ and the fact that if $f(x)\le g(x)$ on $[a,b]$, then $\displaystyle\int_a^b f(x)\,dx\le\int_a^b g(x)\,dx$.

19. Use the fact that $\frac{\sqrt{2}}{2} \leq \cos x \leq \frac{\sqrt{3}}{2}$ on the interval $\left[\frac{\pi}{6}, \frac{\pi}{4}\right]$ and the above inequality for integrals.

20. $x_3 = \frac{466}{395}$

21. $x_3 = \frac{3381}{2869}$

22. The displacement is $\frac{8}{3}$ and the distance is $\frac{98}{3}$

23. $\frac{125}{6}$

24. $\frac{9}{2}$

25. 4π

26. $\frac{1}{3}$

27. $\frac{64}{3}$

28. $\frac{20}{3}$

29. $\frac{16\pi}{15}$

30. $\frac{20\pi}{7}$

31. $\frac{\pi}{30}$

32. $\frac{992\pi}{15}$

33. $\frac{16\pi}{15}$

34. $\dfrac{\pi}{6}$

35. $\dfrac{31\pi}{30}$

36. The number is 1 and sum of it and its reciprocal is 2.

37. He needs to buy $40\sqrt{30}$ feet of fencing to minimize cost.

38. The point on the line closest to $(-3, 1)$ is $\left(\dfrac{5}{7}, \dfrac{33}{7}\right)$

39. The dimensions to make the largest possible volume is $20\ cm \times \dfrac{15}{2}\ cm \times 20\ cm$.

40. $\displaystyle\lim_{n\to\infty} \sum_{i=0}^{n} \frac{2}{2i+n}$

41. $\displaystyle\lim_{n\to\infty} \sum_{i=0}^{n} \frac{2}{n}\left(1+\frac{2i}{n}\right)^4$

42. $\dfrac{1}{4}$