1. a) $(x+3)^2+(y-2)^2=11$, circle with center $(-3,2)$

   b) $\frac{(x-2)^2}{8}-\frac{(y-4)^2}{5}=1$, hyperbola with center $(2,4)$

   c) $\frac{(y+2)^2}{7}+\frac{(x-4)^2}{4}=1$, ellipse with center $(4,-2)$

2. a) $y=16x^2$ and $-\infty \le x \le \infty$ b) $y=\frac{x-1}{x}$ where $x \in (-\infty,0)\cup(0,\infty)$

   c) $y=\frac{1}{2}x+4$ for $-4 \le x \le 6$ d) $x^2+y^2=81$ for $-9 \le x \le 9$, circle, center $(0,0)$

   e) $\frac{y^2}{9}-\frac{x^2}{25}=1$ for $-\infty \le x \le \infty$, hyperbola, center $(0,0)$

   f) $\frac{(x-2)^2}{9}+\frac{(y+5)^2}{4}=1$ for $-1 \le x \le 5$, ellipse, center $(2,-5)$

3. $x=t$, $y=3t^2+6$ for $-\infty \le t \le \infty$

4. $\frac{1}{2},-\frac{1}{5},\frac{1}{10},-\frac{1}{17},\frac{1}{26}$

5. $5,-13,41,-121,365$

6. a) $a_n=\frac{(n+1)}{(2n-1)}$ b) $a_n=3n-2$

7. $\sum_{n=1}^{6}(-1)^{n+1}3^n$

8. 207

9. a) $d=11$ b) $a_n=11n-6$ c) 123,675

10. $a_n=6n-1$, 59

11. $n=60$

12. $r=\frac{5}{3}$

13. $\sum_{n=0}^{\infty}15\left(\frac{1}{5}\right)^n=\frac{75}{4}$

14. -1024

15. $\frac{280}{9}$

16. 10

17. a) Domain: $\mathbb{R}$ Range: $(-3,\infty)$ b)Domain: $(1,\infty)$ Range: $\mathbb{R}$

18. a) $10^1 = 10$ b) $e^y = x$

19. a) $\ln x = 2$ b) $\log 100 = 2$

20. a) -1 b) $\frac{3}{5}+\frac{1}{5}\ln x$

21. $\ln 5+\ln x-\frac{1}{3}\ln\left(x^2+1\right)$

22. $2\ln x+\frac{1}{2}\ln(5x+1)-3\ln(3x-2)$

23. $\log\frac{\left(x^2+1\right)^{\frac{2}{3}}}{\sqrt[3]{4}\,(x-3)}$

24. exact: $\frac{1}{3}\left(\frac{\ln 2}{\ln 5}+1\right)$ approximate: .477

25. exact: $\ln 4$ approximate: 1.386

26. exact: $-\frac{13}{31}$ approximate: $-.419$

27. $x=\frac{7}{3}$

28. $x=0,2$

29. $\frac{2}{x-3}+\frac{-1}{x+2}$

30. $\frac{1}{x}+\frac{2x+4}{x^2+4}$

31. $\frac{2}{x+1}+\frac{3}{(x+1)^2}-\frac{1}{(x+1)^3}$

32. $\frac{1}{18}\left(\frac{-4}{x}-\frac{1}{x+3}+\frac{5}{x-3}\right)$

33. $2x-7+\frac{17}{x+2}+\frac{1}{x+1}$