

1. a) $\frac{x(x+3)}{x-4}$ b) $\frac{x-4}{x(x-1)}$ c) $\frac{5x}{x+5}$ d) $\frac{3x-1}{x}$

2. a) $2(\sqrt{3}-\sqrt{2})$ b) $-1-\sqrt{5}$

3. a) $8a^6b^{-1}$ b) $3a^{\frac{1}{2}}b^{\frac{3}{2}}$ c) $\frac{2}{3}a^2b^{-1}$ d) ab^{-1} e) $a^{-\frac{3}{2}}b$ f) $a^{\frac{5}{6}}b^{\frac{1}{2}}$

4. a) 1 b) $-\frac{3}{2}$ c) 8 d) $\pm\frac{4}{25}$

5. a) $\log_2(5(x+1))$ b) 25

6. a) $\frac{1}{2}$ b) $-x$ c) $2\log_{10}x$

7. a) $\frac{bcx}{bc-cy-bz}$ b) $\frac{S-2bc}{2(b+c)}$ c) $\frac{-\pi h + \sqrt{\pi^2 h^2 + 2A\pi}}{2\pi}$ d) $\frac{A}{nr+1}$ e) $\frac{2x-y}{x+2y}$

8. a) $y-(-1)=(x-(-2))^2$ b) $y-\frac{3}{8}=-\frac{3}{2}\left(x-\left(-\frac{1}{2}\right)\right)^2$ c) $x-(-10)=9\left(y-\frac{1}{3}\right)^2$

9. a) $-4, 0, 4$ b) $-\frac{5}{2}, \frac{5}{2}, 2$ c) $-\frac{3}{2}$ d) $-1, 1$

10. a) $\frac{-3 \pm \sqrt{6}}{2}$ b) $-3, \frac{1}{2}$ c) $-\frac{1}{2}$

11. a) -89 b) x^2+3

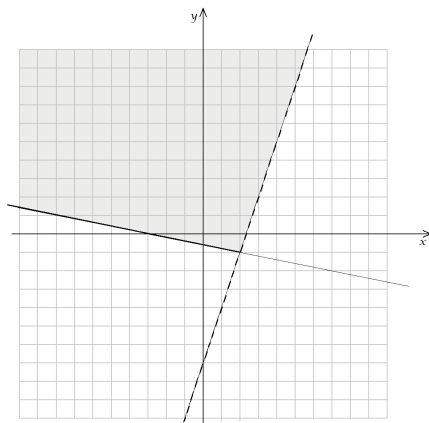
12. a) $-\frac{1}{3}, \frac{1}{4}, 2$ b) $-\frac{1}{2}, \frac{1}{3}$

13. a) $-3 \leq x \leq 1$ b) $x < \frac{2}{3}$ or $x > 1$ c) all x

14. a) $-\frac{6}{5}, 2$ b) $-\frac{4}{3}, 2$

15. a) $7x+3y=2$ b) $3x+2y=1$ c) $y=3$

16. a) $(2, -1)$ b)



17. a) $C(-3, 2)$ $r = \sqrt{10}$ b) $x+3y=13$

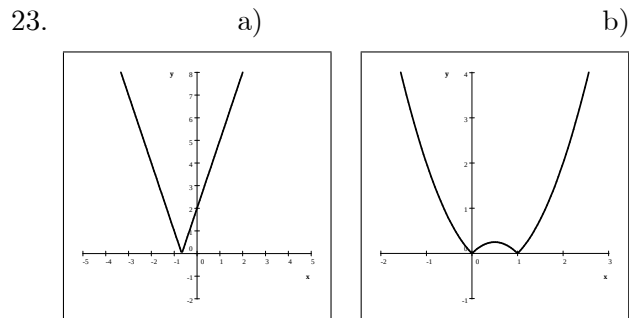
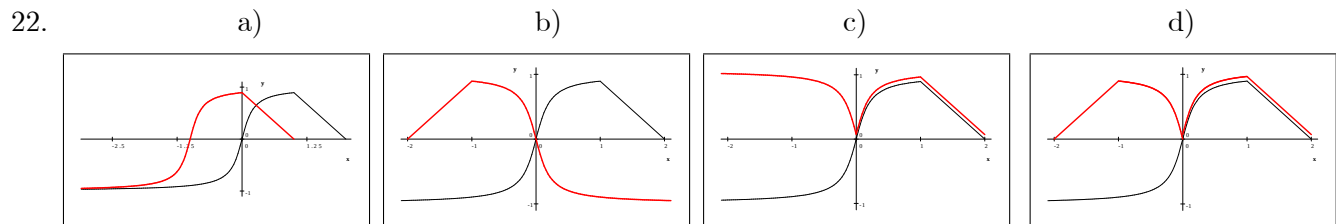
18. a) $(x-1)^2 + (y-2)^2 = 18$ b) $\left(x - \frac{1}{2}\right)^2 + (y-1)^2 = \frac{5}{4}$

19. a) 9 b) $(x-5)^2 + (y-3)^2 = 25$

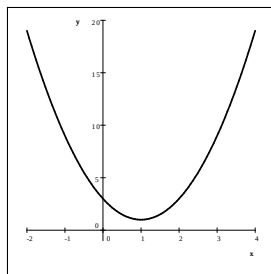
20. a) i) D : all real numbers; $R = \{7\}$ ii) D : all real numbers except $-\frac{1}{2}$; R : all real numbers except $\frac{5}{2}$

b) $x < -2$ or $x > 1$

21. 2

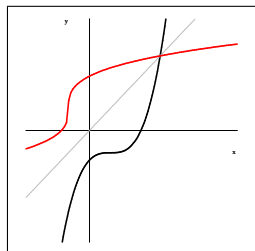


24. a) b) $y = -x^2 + 2x + 3$



25. a) $f^{-1}(x) = \frac{x-3}{2}$ b) $f^{-1}(x) = \frac{x+2}{5x-1}$ c) $f^{-1}(x) = \sqrt{x+2} - 1, \quad x > -1$

26.



27. a) $x = t \left(\frac{r-h}{h} \right)$ b) $\frac{rt}{\sqrt{r^2 - h^2}}$

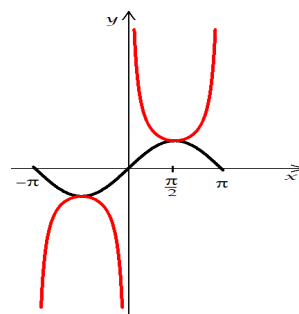
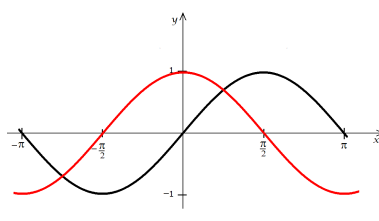
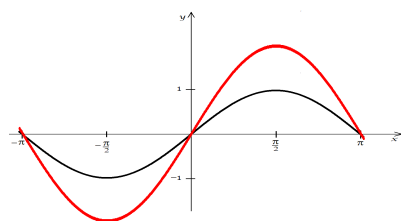
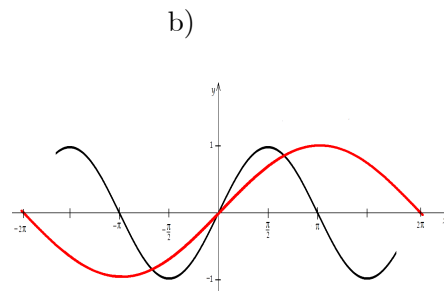
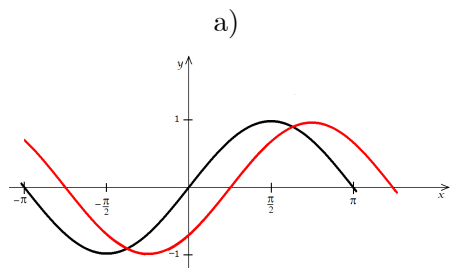
28. a) $1 - \frac{\pi}{4}$ b) $4r + \pi r$ c) $\frac{9\pi}{4} \text{ m}^2$ d) $100\sqrt{5} \text{ km}$ e) $\frac{\pi}{6}$ or 30°

29. a) $-\frac{\sqrt{3}}{2}$ b) $-\frac{\sqrt{3}}{2}$ c) $-\frac{\pi}{4}$ d) $-\frac{\pi}{2}$ e) $\frac{\sqrt{2}}{2}$ f) $\frac{\pi}{3}$ g) $\frac{\sqrt{3}}{3}$ h) π

30. a) $\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ b) $-\frac{\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$ c) $\frac{\pi}{6} + 2k\pi$ or $\frac{5\pi}{6} + 2k\pi$ where k is any integer

31.

32.



c)

d)

e)

33. $\frac{7 + 3\sqrt{3} + \sqrt{5} + 2\sqrt{15}}{11}$

34. $\log_2 3$

35. $\frac{\pi}{\pi - 1}$

36. $8x^2 - 38x + 8y^2 + 20y + 43 = 0$ (a circle)

37. D : all numbers except 0; $R = \{-1, 1\}$

38. a) $h + 2x$ b) $\frac{-1}{(x+1)(x+h+1)}$

39. a) $y = x^2 - 3x + 2$ b) $y = x(x^2 + 3x + 3)(x+1)^3$ c) $x^2 + y^2 = 1$

40. $x \leq \frac{3}{5}$ or $x \geq 1$