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

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

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

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

5. a) $\log_2\left(5\,(x+1)\right)$ b) 25 c) $\log_2 3$

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

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

8. a) $(-2,-1)$ b) $\left(-\dfrac{1}{2},\dfrac{3}{8}\right)$ c) $\left(-10,\dfrac{1}{3}\right)$

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

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

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

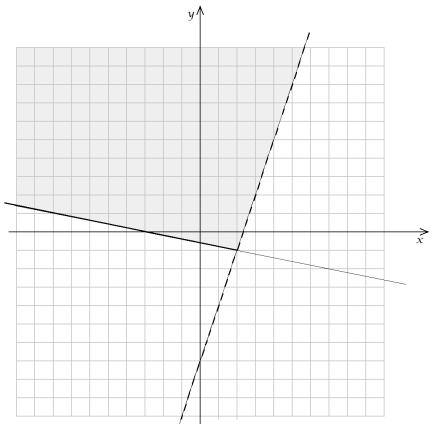
12. $-\dfrac{1}{3},\dfrac{1}{4},2$

13. a) $-3\le x\le 1$ b) $x<\dfrac{2}{3}$ or $x\ge 1$ c) all x

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

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) $x+3y=13$

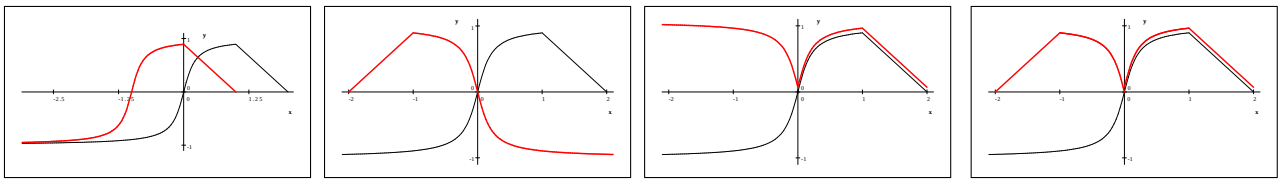
18. a) $(x-1)^2+(y-2)^2=18$ b) $\left(x-\frac{1}{2}\right)^2+(y-1)^2=\frac{5}{4}$ c) $(x-5)^2+(y-3)^2=25$

19. 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 $x>1$

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

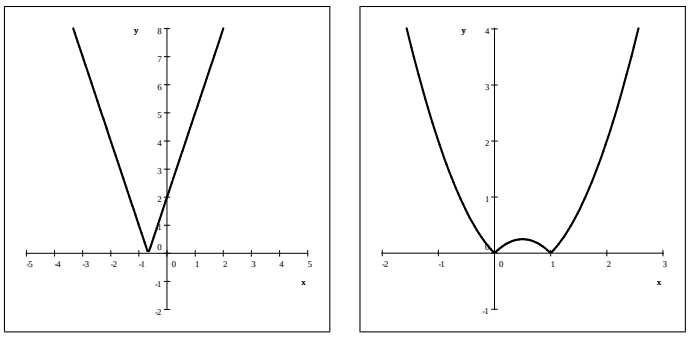
21.

a) b) c) d)

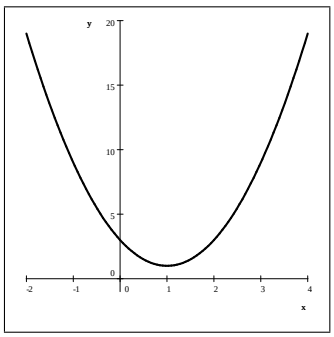


22.

a) b)

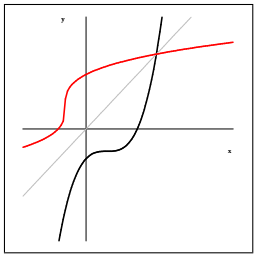


23. a) b) $y=-x^2+2x+3$



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

25.



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

27. $x^2 - 6x + y^2 + 4y + 5 = 0$ (a circle)

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

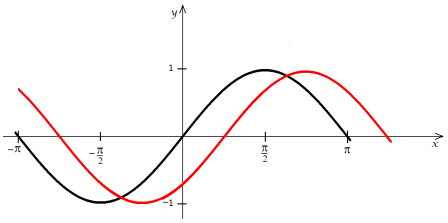
29. a) $1 - \dfrac{\pi}{4}$ b) $4r + \pi r$ c) $\dfrac{9\pi}{4}\,\text{m}^2$ d) $100\sqrt{5}\,\text{km}$ e) $\dfrac{\pi}{6}$ or $30°$

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

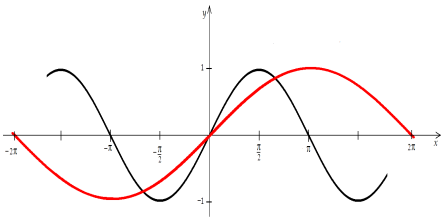
31. a) $\dfrac{\pi}{6}, \dfrac{5\pi}{6}, \dfrac{7\pi}{6}, \dfrac{11\pi}{6}$ b) $-\dfrac{\pi}{2}, \dfrac{\pi}{6}, \dfrac{5\pi}{6}$ c) $\dfrac{\pi}{6} + 2k\pi$ or $\dfrac{5\pi}{6} + 2k\pi$ where k is any integer

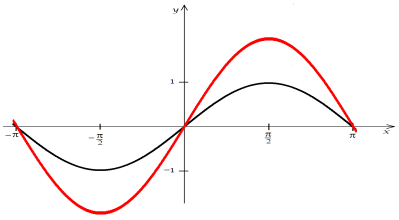
32.

33. a)

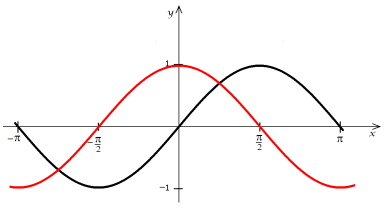


b)

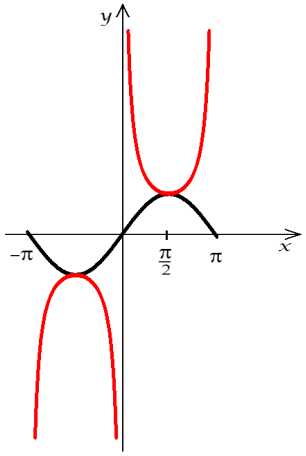




c)



d)



e)