

EXERCISE 3D

$$\begin{aligned}
 1d. \quad & \left. \begin{aligned} y+3=0 &\Rightarrow y=-3 \\ y &= 2x^2+5x-6 \end{aligned} \right\} \\
 & -3 = 2x^2+5x-6 \\
 & 2x^2+5x-3=0 \\
 & (2x-1)(x+3)=0 \\
 & x = \frac{1}{2} \quad x = -3 \\
 & y = -3 \quad y = -3 \\
 & \left(\frac{1}{2}, -3\right) \quad (-3, -3)
 \end{aligned}$$

$$\begin{aligned}
 5b. \quad & y = x^2+5x+18 \\
 & y = -3x+6 \\
 & x^2+5x+18 = -3x+6 \\
 & x^2+8x+12=0 \\
 & (x+6)(x+2)=0 \\
 & x = -6 \quad x = -2 \\
 & y = 24 \quad y = 12 \\
 & (-6, 24) \quad (-2, 12)
 \end{aligned}$$

$$\begin{aligned}
 6b. \quad & y = x+5 \\
 & y = 2x^2-5x+7 \\
 & x+5 = 2x^2-5x+7 \\
 & 2x^2-4x+2=0 \\
 & x^2-2x+1=0 \\
 & (x-1)^2=0 \\
 & x = 1, y = 6 \\
 & (1, 6)
 \end{aligned}$$

$$\begin{aligned}
 2e. \quad & \left. \begin{aligned} 3x+y-1=0 &\Rightarrow y = -3x+1 \\ y &= 6+10x-6x^2 \end{aligned} \right\} \\
 & -3x+1 = 6+10x-6x^2 \\
 & 6x^2-13x-5=0 \\
 & (3x+1)(2x-5)=0 \\
 & x = -\frac{1}{3} \quad x = \frac{5}{2} \\
 & y = 2 \quad y = -3\left(\frac{5}{2}\right)+1 \\
 & \left(-\frac{1}{3}, 2\right) \quad \left(\frac{5}{2}, -\frac{13}{2}\right)
 \end{aligned}$$

$$\begin{aligned}
 7a. \quad & y = x^2+5x+1 \\
 & y = x^2+3x+11 \\
 & x^2+5x+1 = x^2+3x+11 \\
 & 2x-10=0 \\
 & x = 5, y = 5^2+5\cdot 5+1 \\
 & \quad = 51 \\
 & (5, 51)
 \end{aligned}$$

$$\begin{aligned}
 8d. \quad & 6x^2+2x-9 = x^2+7x+1 \\
 & 5x^2-5x-10=0 \\
 & x^2-x-2=0 \\
 & (x-2)(x+1)=0 \\
 & x = 2, \quad x = -1 \\
 & y = 19 \quad y = -5 \\
 & (2, 19) \quad (-1, -5)
 \end{aligned}$$

$$\begin{aligned}
 3b. \quad & y = -2x-7 \\
 & y = x^2+4x+2 \\
 & -2x-7 = x^2+4x+2 \\
 & x^2+6x+9=0 \\
 & (x+3)^2=0 \\
 & x = -3 \quad (-3, -1) \\
 & y = -1
 \end{aligned}$$

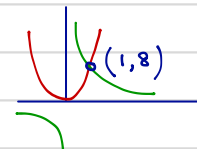
$$\begin{aligned}
 b. \quad & y = x^2-3x-7 \\
 & y = x^2+x+1 \\
 & x^2-3x-7 = x^2+x+1 \\
 & 4x+8=0 \\
 & x = -2, y = 4-2+1=3 \\
 & (-2, 3)
 \end{aligned}$$

$$\begin{aligned}
 e. \quad & (x-2)(6x+5) = (x-5)^2+1 \\
 & 6x^2-7x-10 = x^2-10x+25+1 \\
 & 5x^2+3x-36=0 \\
 & (5x-12)(x+3)=0 \\
 & x = \frac{12}{5} \quad x = -3 \\
 & y = \frac{169}{25}+1 \quad y = 65 \\
 & = \frac{194}{25}
 \end{aligned}$$

$$\begin{aligned}
 c. \quad & y = 7x^2+4x+1 \\
 & y = 7x^2-4x+1 \\
 & 7x^2+4x+1 = 7x^2-4x+1 \\
 & 8x=0 \\
 & x = 0, y = 1 \\
 & (0, 1)
 \end{aligned}$$

$$\begin{aligned}
 f. \quad & 2x^2-6x = x^2+2x \\
 & x^2-8x=0 \\
 & x(x-8)=0 \\
 & x=0, \quad x=8 \\
 & y=0 \quad y=0 \\
 & (0, 0) \quad (8, 0)
 \end{aligned}$$

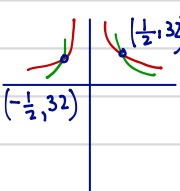
$$\begin{aligned}
 4b. \quad & y = x^2-x \\
 & y = x-1 \\
 & x^2-x = x-1 \\
 & x^2-2x+1=0 \\
 & (x-1)^2=0 \\
 & x = 1, y = 0 \\
 & (1, 0)
 \end{aligned}$$

ga $\left. \begin{aligned} y &= 8x^2 \\ y &= 8x^{-1} \end{aligned} \right\}$ 

$$x^2 = \frac{1}{x}$$

$$x^3 = 1$$

$$x = 1, y = 8 \quad (1, 8)$$

d $\left. \begin{aligned} y &= 8x^{-2} \\ y &= 2x^{-4} \end{aligned} \right\}$ 

$$8x^{-2} = 2x^{-4}$$

$$\frac{8^4}{x^2} = \frac{2^4}{x^4}$$

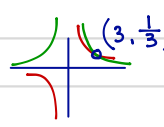
$$4x^4 = x^2 \quad (-\frac{1}{2}, 32)$$

$$4x^4 - x^2 = 0$$

$$x^2(4x^2 - 1) = 0$$

$$x \neq 0, x = \pm \frac{1}{2}$$

$$y = 32$$

b $\left. \begin{aligned} y &= x^{-1} \\ y &= 3x^{-2} \end{aligned} \right\}$ 

$$\frac{1}{x} = \frac{3}{x^2} \quad x \neq 0$$

$$x^2 = 3x$$

$$x^2 - 3x = 0$$

$$x(x - 3) = 0$$

$$x = 0$$

$$x = 3, y = \frac{1}{3}$$

e $\left. \begin{aligned} y &= 9x^{-3} \\ y &= x^{-5} \end{aligned} \right\}$ $\frac{9}{x^3} = \frac{1}{x^5}$

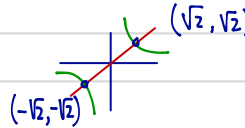
$$9x^5 = x^3$$

$$9x^5 - x^3 = 0$$

$$x^3(9x^2 - 1) = 0$$

$$x \neq 0, x = \pm \frac{1}{3}$$

$$y = 3^5$$

c $\left. \begin{aligned} y &= x \\ y &= 4x^{-3} \end{aligned} \right\}$ 

$$x = \frac{4}{x^3}$$

$$4 = x^4$$

$$x^4 - 4 = 0$$

$$(x^2 + 2)(x^2 - 2) = 0$$

$$x = \pm \sqrt{2}$$

$$y = \pm \sqrt{2}$$

f $\left. \begin{aligned} y &= \frac{1}{4}x^4 \\ y &= 16x^{-2} \end{aligned} \right\}$ $\frac{1}{4}x^4 = \frac{16}{x^2}$

$$16 = \frac{1}{4}x^6$$

$$64 = x^6$$

$$x^6 - 64 = 0$$

$$(x^3 + 8)(x^3 - 8) = 0$$

$$x = \pm 2$$

$$y = 4 \quad (2, 4) \times (-2, 4)$$