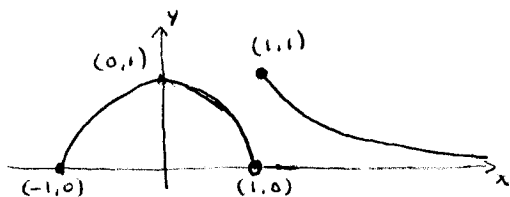
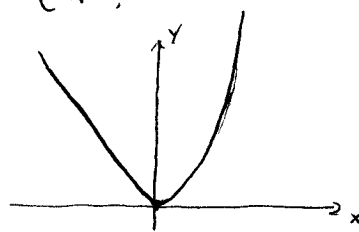


3.2 - (24) $B(x) = \begin{cases} \sqrt{1-x^2}, & \text{if } -1 \leq x < 1 \\ 1/x, & \text{if } x \geq 1 \end{cases}$



(26) $Y = \begin{cases} |x|, & \text{if } x \leq 0 \\ x^2, & \text{if } x > 0 \end{cases}$



W.S. - (2) a) $2x^2 - 6x + 3 = 0$

$x^2 - 3x + \frac{3}{2} = 0$

$x^2 - 3x + \frac{9}{4} = -\frac{3}{2} + \frac{9}{4}$

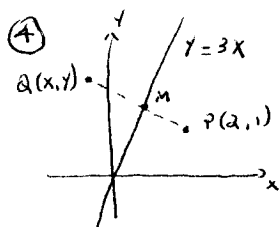
$(x - \frac{3}{2})^2 = \frac{3}{4}$

$x - \frac{3}{2} = \pm \frac{\sqrt{3}}{2}$

$x = \frac{3}{2} \pm \frac{\sqrt{3}}{2} = \boxed{\frac{3 \pm \sqrt{3}}{2}}$

b) $2x^2 - 6x + 3 = 0$

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(2)(3)}}{2(2)} = \frac{6 \pm \sqrt{12}}{4} = \frac{6 \pm 2\sqrt{3}}{4} = \boxed{\frac{3 \pm \sqrt{3}}{2}}$



1) The line through P and Q has equation

$Y - 1 = -\frac{1}{3}(x - 2)$, so $Y - 1 = -\frac{1}{3}x + \frac{2}{3}$ or $Y = -\frac{1}{3}x + \frac{5}{3}$

2) The lines intersect where $3x = -\frac{1}{3}x + \frac{5}{3}$, so

$\frac{10}{3}x = \frac{5}{3}$, $x = \frac{1}{2}$ AND $Y = \frac{3}{2}$. ← (since $Y = 3x$)

3) $M = (\frac{x+2}{2}, \frac{y+1}{2}) = (\frac{1}{2}, \frac{3}{2})$, so $\frac{x+2}{2} = \frac{1}{2}$ AND $\frac{y+1}{2} = \frac{3}{2}$

Gives $x+2=1$ AND $y+1=3$, $x=-1$ AND $y=2$, so $Q = \boxed{(-1, 2)}$

(6) $f(x) = \frac{4}{x^2}$

a) $\frac{f(x) - f(a)}{x - a} = \frac{\frac{4}{x^2} - \frac{4}{a^2}}{x - a} \cdot \frac{x^2 a^2}{x^2 a^2} = \frac{4a^2 - 4x^2}{(x-a)(x^2 a^2)} = \frac{-4(x^2 - a^2)}{(x-a)(x^2 a^2)}$

$= \frac{-4(x-a)(x+a)}{(x-a)(x^2 a^2)} = \boxed{-\frac{4(x+a)}{x^2 a^2}}$

b) $\frac{f(x+h) - f(x)}{h} = \frac{\frac{4}{(x+h)^2} - \frac{4}{x^2}}{h} \cdot \frac{(x+h)^2 x^2}{(x+h)^2 x^2} = \frac{4x^2 - 4(x+h)^2}{h(x+h)^2 x^2}$

$= \frac{4x^2 - 4(x^2 + 2xh + h^2)}{h(x+h)^2 x^2} = \frac{\cancel{4x^2} - \cancel{4x^2} - 8xh - 4h^2}{h(x+h)^2 x^2}$

$= \frac{-8xh - 4h^2}{h(x+h)^2 x^2} = \frac{-4\cancel{h}(2x+h)}{\cancel{h}(x+h)^2 x^2} = \boxed{-\frac{4(2x+h)}{(x+h)^2 x^2}}$

8) $f(x) = \frac{2x+1}{x-4}$

$$\begin{aligned} a) \frac{f(x) - f(a)}{x-a} &= \frac{\frac{2x+1}{x-4} - \frac{2a+1}{a-4}}{x-a} \cdot \frac{(x-4)(a-4)}{(x-4)(a-4)} = \frac{(2x+1)(a-4) - (x-4)(2a+1)}{(x-a)(x-4)(a-4)} \\ &= \frac{2ax + a - 8x - 4 - (2ax - 8a + x - 4)}{(x-a)(x-4)(a-4)} = \frac{9a - 9x}{(x-a)(x-4)(a-4)} \\ &= \frac{-9(x-a)}{(x-a)(x-4)(a-4)} = \boxed{\frac{-9}{(x-4)(a-4)}} \end{aligned}$$

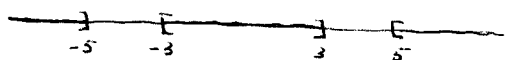
$$\begin{aligned} b) \frac{f(x+h) - f(x)}{h} &= \frac{\frac{2(x+h)+1}{(x+h)-4} - \frac{2x+1}{x-4}}{h} \cdot \frac{(x+h-4)(x-4)}{(x+h-4)(x-4)} \\ &= \frac{(2x+2h+1)(x-4) - (2x+1)(x+h-4)}{h(x+h-4)(x-4)} \\ &= \frac{2x^2 + 2hx + x - 8x - 8h - 4 - (2x^2 + 2hx - 8x + x + h - 4)}{h(x+h-4)(x-4)} \\ &= \frac{-9h}{h(x+h-4)(x-4)} = \boxed{\frac{-9}{(x+h-4)(x-4)}} \end{aligned}$$

9) $f(x) = \sqrt{2x+5}$

$$\begin{aligned} a) \frac{f(x) - f(a)}{x-a} &= \frac{\sqrt{2x+5} - \sqrt{2a+5}}{x-a} \cdot \frac{\sqrt{2x+5} + \sqrt{2a+5}}{\sqrt{2x+5} + \sqrt{2a+5}} = \frac{(2x+5) - (2a+5)}{(x-a)(\sqrt{2x+5} + \sqrt{2a+5})} \\ &= \frac{2(x-a)}{(x-a)(\sqrt{2x+5} + \sqrt{2a+5})} = \boxed{\frac{2}{\sqrt{2x+5} + \sqrt{2a+5}}} \end{aligned}$$

$$\begin{aligned} b) \frac{f(x+h) - f(x)}{h} &= \frac{\sqrt{2(x+h)+5} - \sqrt{2x+5}}{h} \cdot \frac{\sqrt{2(x+h)+5} + \sqrt{2x+5}}{\sqrt{2(x+h)+5} + \sqrt{2x+5}} \\ &= \frac{(2(x+h)+5) - (2x+5)}{h(\sqrt{2x+2h+5} + \sqrt{2x+5})} = \frac{2h}{h(\sqrt{2x+2h+5} + \sqrt{2x+5})} \\ &= \frac{2}{\sqrt{2x+2h+5} + \sqrt{2x+5}} = \boxed{\frac{2}{\sqrt{2x+2h+5} + \sqrt{2x+5}}} \end{aligned}$$

10) $|x^2 - 17| \geq 8$ IFF $x^2 - 17 \leq -8$ OR $x^2 - 17 \geq 8$
 IFF $x^2 \leq 9$ OR $x^2 \geq 25$
 IFF $\sqrt{x^2} \leq \sqrt{9}$ OR $\sqrt{x^2} \geq \sqrt{25}$
 IFF $|x| \leq 3$ OR $|x| \geq 5$
 IFF $-3 \leq x \leq 3$ OR $x \leq -5$ OR $x \geq 5$



SOL: $\boxed{(-\infty, -5] \cup [-3, 3] \cup [5, \infty)}$

COR REWRITE $x^2 \leq 9$ AS $x^2 - 9 \leq 0$ OR $(x-3)(x+3) \leq 0$
 AND $x^2 \geq 25$ AS $x^2 - 25 \geq 0$ OR $(x-5)(x+5) \geq 0$