

3HD3, 25.10.2018

$$\begin{aligned} \textcircled{1} \text{ a) } f(x) &= \frac{1}{2}x^2 - 4x + 2 \\ &= \frac{1}{2}(x^2 - 8x) + 2 \\ &= \frac{1}{2}(x^2 - 8x + 16 - 16) + 2 \\ &= \frac{1}{2}[(x-4)^2 - 16] + 2 \\ &= \frac{1}{2}(x-4)^2 - 8 + 2 \\ \underline{f(x) &= \frac{1}{2}(x-4)^2 - 6} \end{aligned}$$

$$\begin{aligned} S\left(-\frac{b}{2a} / c - \frac{b^2}{4a}\right) \\ S\left(-\frac{-4}{2 \cdot \frac{1}{2}} / 2 - \frac{4^2}{4 \cdot \frac{1}{2}}\right) \\ S\left(4 / 2 - \frac{16}{2}\right) \\ \underline{S(4 / -6)} \end{aligned}$$

$$\begin{aligned} \text{b) } f(x) &= -3x^2 - 12x + 3 \\ &= -3(x^2 + 4x) + 3 \\ &= -3(x^2 + 4x + 4 - 4) + 3 \\ &= -3[(x+2)^2 - 4] + 3 \\ &= -3(x+2)^2 + 12 + 3 \\ \underline{f(x) &= -3(x+2)^2 + 15} \end{aligned}$$

$$\begin{aligned} S\left(-\frac{b}{2a} / c - \frac{b^2}{4a}\right) \\ S\left(-\frac{-12}{2(-3)} / 3 - \frac{12^2}{4(-3)}\right) \\ S\left(\frac{12}{-6} / 3 - \frac{144}{-12}\right) \\ S(-2 / 3 - (-12)) \\ \underline{S(-2 / 15)} \end{aligned}$$

$$\begin{aligned} \text{c) } g(x) &= -\frac{1}{5}x^2 + \frac{6}{5}x - \frac{29}{5} \\ &= -\frac{1}{5}(x^2 - 6x) - \frac{29}{5} \\ &= -\frac{1}{5}(x^2 - 6x + 9 - 9) - \frac{29}{5} \\ &= -\frac{1}{5}[(x-3)^2 - 9] - \frac{29}{5} \\ &= -\frac{1}{5}(x-3)^2 + \frac{9}{5} - \frac{29}{5} \\ \underline{g(x) &= -\frac{1}{5}(x-3)^2 - 4} \end{aligned}$$

$$\begin{aligned} S\left(-\frac{b}{2a} / c - \frac{b^2}{4a}\right) \\ S\left(-\frac{\frac{6}{5}}{2(-\frac{1}{5})} / -\frac{29}{5} - \frac{(\frac{6}{5})^2}{4(-\frac{1}{5})}\right) \\ S\left(-\frac{\frac{6}{5}}{\frac{-2}{5}} / -\frac{29}{5} - \frac{\frac{36}{25}}{\frac{-4}{25}}\right) \\ S\left(\frac{30}{10} / -\frac{29}{5} + \frac{5 \cdot 36}{4 \cdot 25}\right) \\ S\left(3 / -\frac{29}{5} + \frac{9}{5}\right) \\ \underline{S(3 / -4)} \end{aligned}$$

$$\textcircled{2} p_1: S(5|-4) \Rightarrow p_1(x) = a(x-5)^2 - 4$$

$$a = \frac{1}{2} \Rightarrow p_1(x) = \frac{1}{2}(x-5)^2 - 4$$
$$= \frac{1}{2}(x^2 - 10x + 25) - 4$$
$$= \frac{1}{2}x^2 - 5x + \frac{25}{2} - \frac{8}{2}$$

$$\underline{\underline{p_1(x) = \frac{1}{2}x^2 - 5x + \frac{17}{2}}}$$

$$p_2: S(-2|8) \Rightarrow p_2(x) = a(x+2)^2 + 8$$

$$a = -\frac{1}{5} \Rightarrow p_2(x) = -\frac{1}{5}(x+2)^2 + 8$$
$$= -\frac{1}{5}(x^2 + 4x + 4) + 8$$
$$= -\frac{1}{5}x^2 - \frac{4}{5}x - \frac{4}{5} + \frac{40}{5}$$

$$\underline{\underline{p_2(x) = -\frac{1}{5}x^2 - \frac{4}{5}x + \frac{36}{5}}}$$

~~$$p_3: S(5|4) \Rightarrow p_3(x) = a(x-5)^2 - 4$$~~

~~a~~

$$p_3: S(-4|-6) \Rightarrow p_3(x) = a(x+4)^2 - 6$$

$$a = 2 \Rightarrow p_3(x) = 2(x+4)^2 - 6$$
$$= 2(x^2 + 8x + 16) - 6$$
$$= 2x^2 + 16x + 32 - 6$$

$$\underline{\underline{p_3(x) = 2x^2 + 16x + 26}}}$$