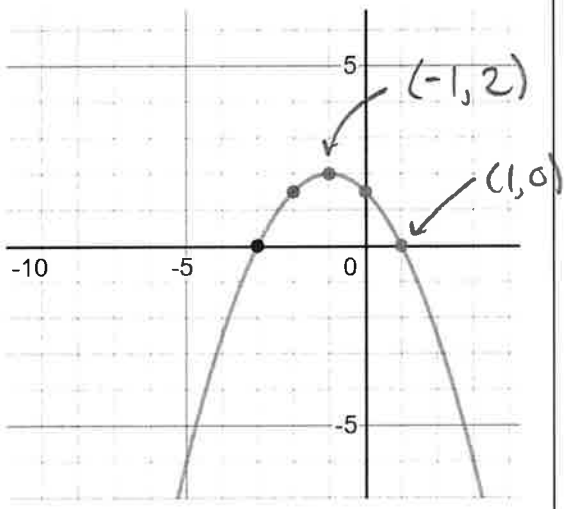
Section 4.1 and 4.2 – Checking Your understanding

Answer the following four questions, show as many steps as you need to, write clearly and neatly.

1. Find the equation of the given graph in the form: $f(x) = a(x-h)^2 + k$



$y = a(x+1)^2 + 2$

sub any other point

$0 = a(1+1)^2 + 2$

$-2 = a(2)^2 \rightarrow -2 = 4a$

$a = -\frac{1}{2}$

$$y = -\frac{1}{2}(x+1)^2 + 2$$

2. Find the Vertex by completing the square, the $x-intercepts$ $(if\ possible)$, $and\ y-intercepts$

$f(x) = -2x^2 - 6x - 4$

$-2(x^2+3x) - 4$

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

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

$-2(x+\frac{3}{2})^2 + \frac{9}{2} - \frac{8}{2}$

$-2(x+\frac{3}{2})^2 + \frac{1}{2}$

vertex: $(-\frac{3}{2}, \frac{1}{2})$

y-ints: $(0, -4)$

x-ints: $(-2, 0)$ $(-1, 0)$

$0 = -2x^2 - 6x - 4$

↓ divide all by -2

$0 = x^2 + 3x + 2$

$0 = (x+2)(x+1)$

$x = -1$

$x = -2$

3. Find the Vertex, by Completing the Square of:

$$g(x) = 3x^2 + 6x + 2$$

$3(x^2+2x)+2$

$3(x^2+2x+1-1)+2$

$3(x^2+2x+1)-3+2$

$3(x+1)^2-1$

$\boxed{(-1,-1)}$

4. Given the following Equation, state the Vertex, Max/Min, Axis of Symmetry, Domain and Range, and $y-intercept$

$$y = -2(x+3)^2 - 4$$

vertex: $(-3,-4)$

Max

AofS: $x=-3$

D: $\mathbb{R}$

R: $y \leq -4$

y-int: $(0,-22)$

$y = -2(0+3)^2-4$

$-2(3)^2-4$

$-2(9)-4$

$-18-4$

-22