HW: A20 pg. 190 #26-32

11.3 Vertex Form

To graph equations in standard form $y=ax^2+bx+c$, one way is to complete the square to get into vertex form $y=A(B(x-c))^2+D$.

Ex#1 Graph the following by converting to vertex form. What are the vertex and AOS? → axis of symmetry

a) $g(x)=x^2+6x+5$

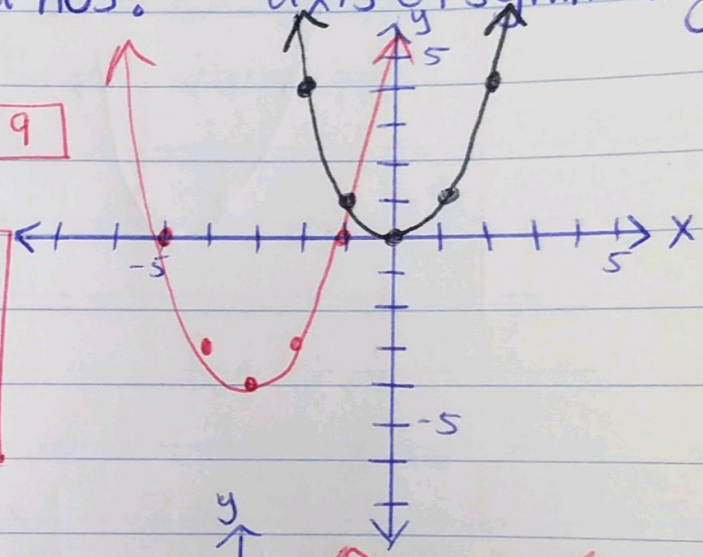
$-5+\boxed{9}=x^2+6x+\boxed{9}$

$4=(x+3)^2$

$g(x)=(x+3)^2-4$ (← 3, ↓ 4)

vertex: $(-3,-4)$

AOS: $x=-3$



b) $h(x)=x^2-8x+17$

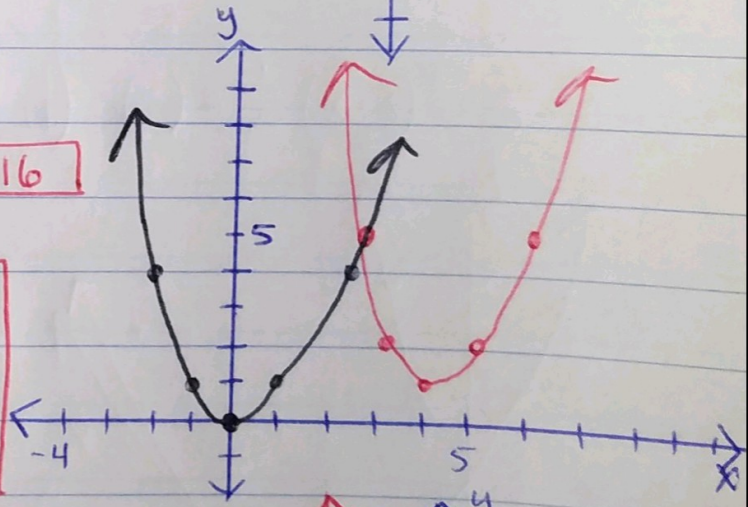
$-17+\boxed{16}=x^2-8x+\boxed{16}$

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

$h(x)=(x-4)^2+1$ (→ 4, ↑ 1)

vertex: $(4,1)$

AOS: $x=4$



c) $j(x)=2x^2+4x+5$

$\frac{j(x)}{2}=x^2+2x+\frac{5}{2}$

$-\frac{5}{2}+\boxed{1\left(\frac{2}{2}\right)}=x^2+2x+\boxed{1}$

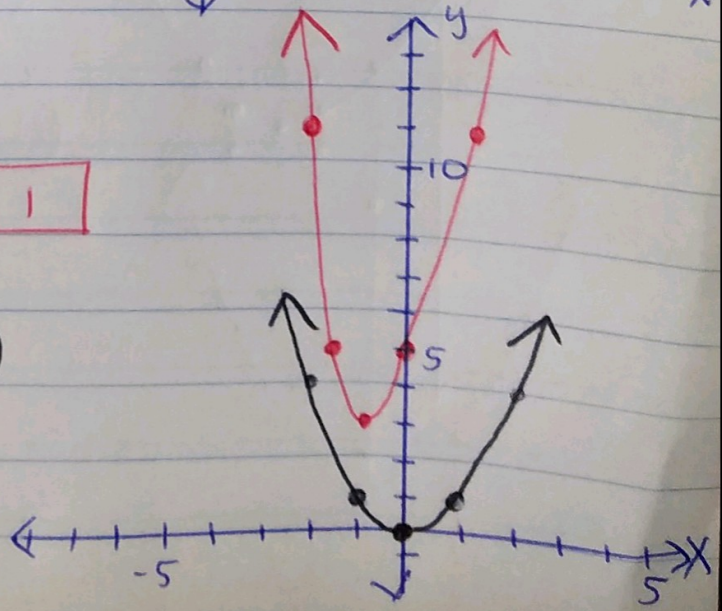
$-\frac{3}{2}=(x+1)^2$

$2\left(\frac{j(x)}{2}=(x+1)^2+\frac{3}{2}\right)$

$j(x)=2(x+1)^2+3$ (← 1, ↑ 3)

vertex: $(-1,3)$

AOS: $x=-1$



d) $k(x) = -3x^2 + 12x - 7$

$\frac{k(x)}{-3} = x^2 - 4x + \frac{7}{3}$

$-\frac{7}{3} + \boxed{4\left(\frac{3}{3}\right)} = x^2 - 4x + \boxed{4}$

$-\frac{7}{3} + \frac{12}{3} = (x-2)^2$

$\frac{5}{3} = (x-2)^2$

$\frac{k(x)}{-3} = (x-2)^2 - \frac{5}{3}$

$k(x) = -3(x-2)^2 + 5$

vertex: $(2, 5)$

AOS: $x = 2$