

#6  $f(x) = 2x^2 - 5x + 1$

$a = 2$   
pos.  
U

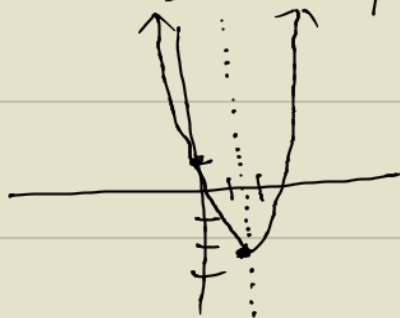
Vertex

- ①  $a = 2$   $b = -5$
- ②  $-\frac{b}{2a} = \frac{-(-5)}{2(2)} = \frac{5}{4}$  ) x
- ③  $f\left(\frac{5}{4}\right) = 2\left(\frac{5}{4}\right)^2 - 5\left(\frac{5}{4}\right) + 1$   
 $= 2\left(\frac{25}{16}\right) - \frac{25}{4} + 1$   
 $= \frac{25}{8} - \frac{50}{8} + \frac{8}{8}$   
 $= \frac{-25}{8} + \frac{8}{8}$   
 $= \frac{-17}{8}$

Vertex =  $\left(\frac{5}{4}, -\frac{17}{8}\right)$   
 $\frac{1}{4}, -2\frac{1}{8}$

AOS:  $x = \frac{5}{4}$

min:  $-\frac{17}{8}$



$y = 1$   
 $y = 2(0)^2 - 5(0) + 1$   
 $y = 1$

#7

$f(x) = -2x^2 + 10x + 3$

$a = -2$   
max  
∩

- ①  $a = -2$   $b = 10$
- ②  $-\frac{b}{2a} = \frac{-10}{2(-2)} = \frac{-10}{-4} = \frac{5}{2}$
- ③  $f\left(\frac{5}{2}\right) = -2\left(\frac{5}{2}\right)^2 + 10\left(\frac{5}{2}\right) + 3$   
 $= -2\left(\frac{25}{4}\right) + \frac{50}{2} + 3$   
 $= \frac{-50}{4} + 25 + 3$

$$= \frac{-25}{2} + 28$$

$$= \frac{-25}{2} + \frac{28}{1}$$

$$= \frac{-25}{2} + \frac{56}{2}$$

$$= \frac{31}{2}$$

max  $\frac{31}{2}$   
at  $x = \frac{5}{2}$

#5

$f(x) = -3x^2 + 12x - 1$

$(-4, \frac{1}{3})$   
 $(-2)^2$   
 4

$$= -3(x^2 - 4x) - 1$$

$$= -3\left(\underbrace{x^2 - 4x + 4}_{\text{Group 1}} - \underbrace{4}_{\text{Group 2}}\right) - 1$$

$$= -3(x^2 - 4x + 4) - 3(-4) - 1$$

$$= -3(x^2 - 4x + 4) + 12 - 1$$

$$= -3(x-2)^2 + 11$$

$\downarrow$                        $\downarrow$   
 $h=2$                        $k=11$

- ① FACTOR OUT THE NUMBER IN FRONT OF THE  $x^2$  FROM BOTH  $x^2$  AND  $x$
- ② COMPLETE THE SQUARE ON WHAT IS INSIDE PARENTHESES
- ③ MULTIPLY # OUT IN FRONT OF EACH GROUP

Vertex:  $(2, 11)$