

Given that $ax^3 + bx^2 + 17x - 6$ is exactly divisible by $(x - 1)(x - 2)$, find the value of a and the value of b .

$$\text{Let } f(x) = ax^3 + bx^2 + 17x - 6$$

$(x - 1)$ is a factor

$$f(1) = 0$$

$$f(1) = a(1)^3 + b(1)^2 + 17(1) - 6 = 0$$

$$a + b + 17 - 6 = 0$$

$$a + b = -11$$

$(x - 2)$ is a factor

$$f(2) = 0$$

$$f(2) = a(2)^3 + b(2)^2 + 17(2) - 6 = 0$$

$$8a + 4b + 34 - 6 = 0$$

$$8a + 4b = -28$$

$$2a + b = -7$$

$$2a + b = -7$$

$$a + b = -11$$

$$a = 4$$

$$b = -15$$