

1. 8.
10. $f'(x) = 3x^2 + 2ax + b$ $f'(-3) = 0$
 $0 = 27 - 6a + b$ $f'(1) = 0$

$$0 = 3 + 2a + b$$

①
② $-27 = -6a + b$
 $-3 = 2a + b$

at $x = -3$
 $f' = 0$
 $(-3 | 8)$ $(1 | -14)$

$$-24 = -8a$$

$$\frac{-24}{-8} = a$$

$3 = a$

$$-3 = 2(3) + b$$

$$-3 = 6 + b$$

$$-9 = b$$

$$f(x) = x^3 + 3x^2 - 9x + C$$

sub in $(1 | -14)$
 $x | y$
 $-14 = 1^3 + 3(1)^2 - 9(1) + C$

$$-14 = -5 + C$$

$$-14 + 5 = C$$

$$-9 = C$$

10.

$$f(x) = ax^2 + bx + c$$

$$f'(x) = 2ax + b$$

If a graph is increasing $f'(x) > 0$

$$2ax + b > 0$$

$$2ax > -b$$

$$x > -\frac{b}{2a}$$

$$f'(x) < 0$$