

**Question:**

Find the intervals where  $h(x) = -3x^4 + 4x^3 + 48x^2$  is concave up and concave down.

**Solution:**

$$h(x) = -3x^4 + 4x^3 + 48x^2$$
$$h'(x) = -12x^3 + 12x^2 + 96x$$
$$h''(x) = -36x^2 + 24x + 96$$

$$h''(x) = 0$$

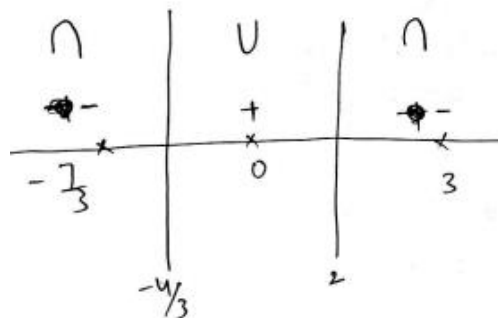
$$-36x^2 + 24x + 96 = 0$$

$$12(-3x^2 + 2x + 8) = 0$$

$$\left(x + \frac{4}{3}\right)(x - 2) = 0$$

$$\boxed{x = -\frac{4}{3}} \quad \boxed{x = 2}$$

$f'(x)$	$12$	$x + \frac{4}{3}$	$x - 2$	
$f'(-\frac{7}{3})$	+	-	-	= +
$f'(0)$	+	+	-	= -
$f'(3)$	+	+	+	= +



Concave down  $(-\infty, -\frac{4}{3})$ ,  $(2, \infty)$

Concave up  $(-\frac{4}{3}, 2)$