



20th December

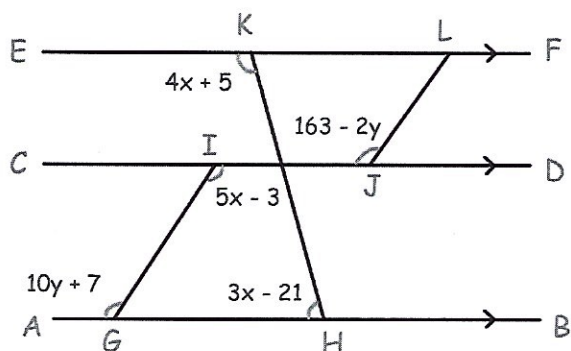
Expand and simplify

$$(x - 3)(x - 4)(x + 7)$$

$$(x^2 - 7x + 12)(x + 7)$$

$$x^3 - 7x^2 + 12x + 7x^2 - 49x + 84$$

$$x^3 - 37x + 84$$



The lines AB, CD and EF are parallel.  
GI, HK and JL are straight lines.

Show GI and JL are parallel.

$$\angle EKR + \angle AHR = 180^\circ$$

(Co-interior angles)

$$4x + 5 + 3x - 21 = 180$$

$$x = 28^\circ$$

$$\angle AGI = \angle DIG \text{ (alternate angles)}$$

$$10y + 7 = 5 \times 28 - 3$$

$$y = 13^\circ$$

$$\angle AGI = 137^\circ$$

$$\angle IJL = 137^\circ$$

$\therefore$  GI & JL are parallel

$$y = -6x^3 + 9x^2 + 2$$

Find the coordinates of the stationary points and determine their nature.

$$\frac{dy}{dx} = -18x^2 + 18x$$

$$-18x^2 + 18x = 0$$

$$18x(1-x) = 0$$

$$\therefore x = 0 \text{ or } x = 1$$

$$y = 2 \quad y = 5$$

$$\frac{d^2y}{dx^2} = -36x + 18$$

$$\underline{(0, 2)} \quad \frac{d^2y}{dx^2} = 18 \quad \therefore \text{Minimum}$$

$$\underline{(1, 5)} \quad \frac{d^2y}{dx^2} = -18 \quad \therefore \text{Maximum}$$