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1) A(-7,4) B(3,-1) C(6,1) D(K,-15)

a) Gradient of AB.

$$\frac{y_1 - y_2}{x_1 - x_2} = \frac{-1-4}{3--7} = \frac{-5}{10} = -1/2$$ ✓

b) find equation of AB

$$y - -y_1 = m(x - x_1)$$
$$y - -1 = -1/2(x - 3)$$ ✓
$$y + 1 = -1/2(x - 3)$$
$$2(y+1) = -x + 3$$
$$2y + 1 = -x + 3$$ ✓
$$2y + 1 - 3 = -x$$
$$2y + 2 - 3 + x = 0$$ ✓
$$2y - 1 + x = 0$$ ✓

c) find Length of AB.

$$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$= \sqrt{(4 - -1)^2 + (-7 - 3)^2}$$ ✓
$$= \sqrt{(5)^2 + (-10)^2}$$
$$= \sqrt{25 + 100}$$
$$= \sqrt{125}$$ ✓

D) $\left(\frac{-7+3}{2}, \frac{4+-1}{2}\right)$ ✓

-2, 1.5 ✓

Gradient of line AB = $-1/2$

Gradient of line CD = 2

c) $2 = \frac{1 - -15}{6 - k}$ ✓

$2 = \frac{16}{6 - k}$ ✓

$k = -2$ ✓