1-1.6.16

AI24BTECH11011 - Himani Gourishetty

1) Find the values of k if the points $\left(A\right)(k+1,2k)$, $\left(B\right)(3k,2k+3)$, $\left(C\right)(5k-1,5k)$ are collinear.
Solution Given,

Variable	Description	formula
A (x_1, y_1)	$(k+1, 2k)$	-
B (x_2, y_2)	$(3k, 2k+3)$	-
C (x_3, y_3)	$(5k-1, 5k)$	-
P	Area formed by the 3 points	$x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)$

for these points to be collinear , the area should be zero;

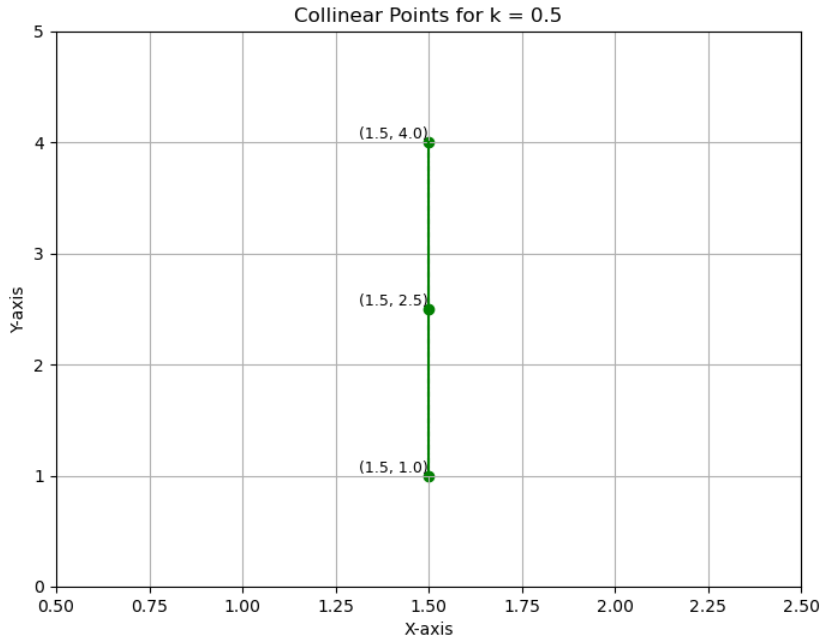
$$P = x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2) \tag{1}$$

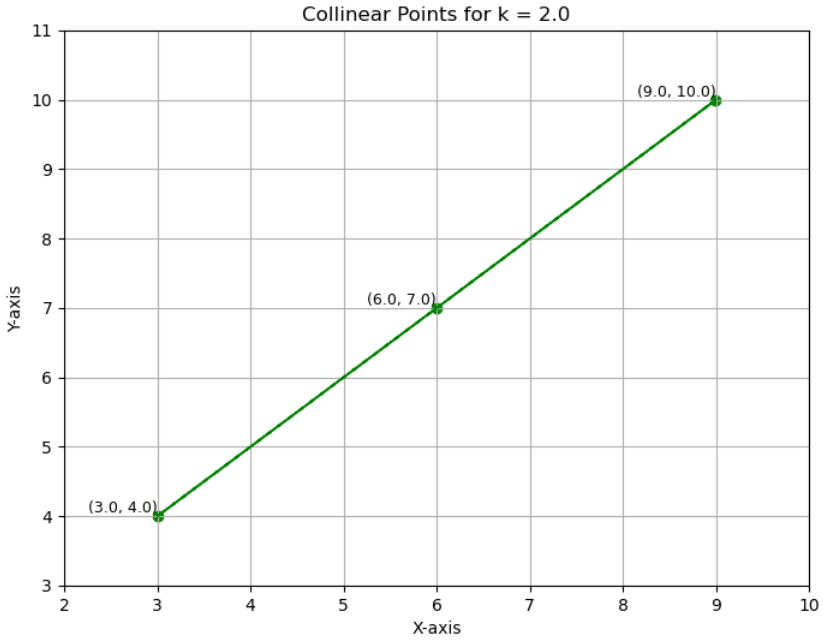
$$0 = (k+1)(-3k+3)+(3k)(3k)+(5k-1)(-3) \tag{2}$$

$$0 = 6k^2-15k+60 = (6k-3)(k-2) \tag{3}$$

then,

$$k = 2; k = 0.5 \tag{4}$$




Collinear Points for k = 2.0
(9.0, 10.0)
(6.0, 7.0)
(3.0, 4.0)
Y-axis
X-axis
11
10
9
8
7
6
5
4
3
2
3
4
5
6
7
8
9
10