1-1.4-9c

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In what ratio does the point $(-4, 6)$ divide the line segment joining the points $A\,(-6, 0)$ and $B\,(3, -8)$?

Solution:

Let the given point divides the line segment AB in a ratio k:1.

Variable	Description
C	Given point
k	The ratio in which the given point divides the line segment

TABLE 0: variables used

using section formulae:

$$C = \frac{A + kB}{1 + k} \tag{0.1}$$

$$\tag{0.2}$$

by modifying it we get

$$k = \frac{(B - C)^T (C - A)}{\|B - C\|^2} \tag{0.3}$$

by substituting the values we get

$$k = \frac{\begin{pmatrix} 7 & -14 \end{pmatrix} \begin{pmatrix} 2 \\ 6 \end{pmatrix}}{49 + 196} \tag{0.4}$$

$k = \frac{-2}{7}$

So, the given point divides the line segment AB in the ratio 2:7 externally.