



# MOTHERSON EXHIBIT 1010



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orthogonal



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# orthogonal

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or·thog·o·nal | \ őr-'thā-gə-nəl  \

## Definition of *orthogonal*

**1a** : intersecting or lying at right angles In orthogonal cutting, the cutting edge is perpendicular to the direction of tool travel.

**b** : having perpendicular slopes or tangents at the point of intersection orthogonal curves

**2** : having a sum of products or an integral (see [integral entry 1 sense 1b](#)) that is zero or sometimes one under specified conditions: such as

a of real-valued functions : having the integral of the product of each pair of functions over a specific interval equal to zero

b of vectors : having the [scalar product](#) equal to zero

c of a square matrix : having the sum of products of corresponding elements in any two rows or any two columns equal to one if the rows or columns are the same and equal to zero otherwise : having a [transpose](#) with which the product equals the [identity matrix](#)

**3** of a linear transformation : having a matrix (see [matrix sense 5a](#)) that is orthogonal : preserving length and distance

**4** : composed of mutually orthogonal elements an orthogonal basis of a vector space


**5** : statistically independent mental ability may be classified into several orthogonal ... factors— O. D. Duncan


**6** : [orthographic sense 1](#) orthogonal projection

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## Other Words from *orthogonal*

orthogonality \ őr-, thā-gə-'na-lə-tē  \ noun

orthogonally \ őr-'thā-gə-nəl-ē  \ adverb

## Examples of *orthogonal* in a Sentence

Recent Examples on the Web It is moved in a straight line (*orthogonal* or diagonal) to the first vacant intersection beyond the men, and the men so jumped are immediately removed. — [Quanta Magazine, "A Life in Games," 28 Aug. 2015](#) The methods developed so far really think about genetics and environment as separate and *orthogonal*, as independent factors. — [Quanta Magazine, "New Turmoil Over Predicting the Effects of Genes," 23 Apr. 2019](#)

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## First Known Use of *orthogonal*

circa 1560, in the meaning defined at [sense 1a](#)

## History and Etymology for *orthogonal*

Middle French, from Latin *orthogonius*, from Greek *orthogōnios*, from *orth-* + *gōnia* angle — more at [-gon](#)

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Time Traveler for *orthogonal*



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orthogonal

[adjective](#)or·thog·o·nal | \ ər-'thäg-ən-əl  \

## Medical Definition of *orthogonal*

1a : lying or intersecting at right angles

b : being, using, or made with three ECG leads whose axes are perpendicular to each other and to the frontal, horizontal, and sagittal axes of the body the three orthogonal leads were recorded simultaneously on magnetic tape — Massoud Nemati et al

2 : statistically independent mental ability may be classified into several orthogonal...factors— O. D. Duncan

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