Applications of Integration

AP Calculus AB · Vocabulary in context

Word	Example
average value /ˈævrɪdʒ ˈvæljuː/	The **average value** of f on [a, b] is the integral divided by b − a. f [a, b] b − a
continuous function	A **continuous function** has no breaks.
integral /ˈɪntɪgrəl/	Use an **integral** to find the area under a curve.
interval /ˈɪntəvl/	The **interval** from 2 to 5 includes every number between them. 2 5
rectangle /ˈrektæŋgl/	The average value is the height of a **rectangle** with the same area.
average rate of change /ˈævrɪdʒ reɪt ɒv tʃeɪndʒ/	The **average rate of change** is the change in y divided by the change in x. y x
Riemann sum /ˈriːmən sʌm/	A **Riemann sum** adds the areas of thin rectangles under a curve.
particle /ˈpɑːtɪkl/	Modelling the ball as a **particle** means we ignore its size and any rotation.
displacement /dɪˈspleɪsmənt/	After walking 3 km east, your **displacement** is 3 km east. 3 km 3 km
total distance travelled /ˈtəʊtl ˈdɪstəns ˈtrævld/	**Total distance travelled** is the integral of speed.
speed /spiːd/	The bus moves at a **speed** of 15 m/s. 15 m/s
velocity /vəˈlɒsɪti/	The ball's **velocity** is 5 m/s to the left. 5 m/s

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acceleration /əkˌseləˈreɪʃn/	The car speeds up quickly, so its **acceleration** is large.
absolute value /ˈæbsəluːt ˈvæljuː/	Speed is the **absolute value** of velocity.
sign change /saɪn tʃeɪndʒ/	A **sign change** in f' from + to − shows a maximum. f' + −
origin /ˈɒrɪdʒɪn/	The graph of $y = x^2$ passes through the **origin**. $y = x^2$
initial condition /ɪˈnɪʃl kənˈdɪʃn/	The **initial condition** $y(0) = 5$ gives the starting value. $y(0) = 5$
trapezoid /ˈtræpɪzɔɪd/	Each strip under the curve is a **trapezoid**.
net change /net tʃeɪndʒ/	The integral of a rate gives the **net change** in the amount.
definite integral /ˈdefɪnət ˈɪntɪgrəl/	A **definite integral** has limits and gives a number, such as an area.
intersection point /ˌɪntəˈsekʃn pɔɪnt/	Find the **intersection point** where the two curves meet.
limits of integration /ˈlɪmɪts ɒv ˌɪntɪˈgreɪʃn/	In $\int$ from 1 to 3, the **limits of integration** are 1 and 3. 1 3 $\int$ 1 3
horizontal slice /ˌhɒrɪˈzɒntl slaɪs/	A **horizontal slice** is integrated with respect to y. y
parabola /pəˈræbələ/	A thrown ball follows a **parabola**.
cross section /krɒs ˈsekʃn/	Each **cross section** of the solid is a square.
perpendicular /ˌpɜːpənˈdɪkjʊlə/	The wall is **perpendicular** to the floor.
volume /ˈvɒljuːm/	The **volume** of the box is $2\text{ m} \times 1\text{ m} \times 1\text{ m} = 2\text{ m}^3$. $2\text{ m} \times 1\text{ m} \times 1\text{ m} = 2\text{ m}^3$

Word	Example
square /skweə/	The area of a **square** is its side squared.
triangle /ˈtraɪæŋgl/	The angles in a **triangle** add to 180°.
semicircle /ˈsemɪsɜːkl/	A **semicircle** is half a circle.
diameter /daɪˈæmɪtə/	Measure the **diameter** of the wire with a micrometer.
solid of revolution /ˈsɒlɪd ɒv ˌrevəˈluːʃn/	Turn a region around a line to make a **solid of revolution**.
disc /dɪsk/	Each slice is a **disc**.
radius /ˈreɪdɪəs/	The **radius** of a circle is the distance from the centre to the edge.
washer /ˈwɒʃə/	Each slice is a **washer** with a hole.

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