

Watch. Practice. Understand. | Lesson 262

Calculus 2 5 Continuity and Discountinuity

Watch the matching video: <https://www.youtube.com/watch?v=fp60copHUXY>

Practice focus: Continuity

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 Choose k to make $f(x)=(x^2-4)/(x-2)$ for $x \neq 2$ and $f(2)=k$ continuous at 2.

02 Classify the discontinuity of $f(x)=1/(x-3)$ at 3.

03 State the three requirements for continuity at $x=a$.

04 Use continuity to show $x^3 + x - 1$ has a zero in $(0,1)$.

Worked answers | Lesson 262

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01 Choose k to make $f(x)=(x^2-4)/(x-2)$ for $x \neq 2$ and $f(2)=k$ continuous at 2.

The limit is $\lim_{x \rightarrow 2} (x+2)=4$. Set $k=4$.

02 Classify the discontinuity of $f(x)=1/(x-3)$ at 3.

Infinite discontinuity: the denominator tends to 0 while numerator remains 1; $x=3$ is a vertical asymptote.

03 State the three requirements for continuity at $x=a$.

$f(a)$ is defined; $\lim_{x \rightarrow a} f(x)$ exists; that limit equals $f(a)$.

04 Use continuity to show $x^3 + x - 1$ has a zero in $(0,1)$.

It is a continuous polynomial; $f(0)=-1$ and $f(1)=1$. The intermediate value theorem guarantees a zero.