

Use continuity to evaluate the limit.

$$\lim_{x \rightarrow 1} e^{(2x^2-2x)}$$

Take the limit:

$$\lim_{x \rightarrow 1} e^{2x^2-2x}$$

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The limit of a quotient is the quotient of the limits:

$$= \frac{\lim_{x \rightarrow 1} e^{2x^2}}{\lim_{x \rightarrow 1} e^{2x}}$$

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Using the continuity of  $e^{2x}$  at  $x = 1$  write  $\lim_{x \rightarrow 1} e^{2x}$  as  $e^{\lim_{x \rightarrow 1} 2x}$ :

$$= e^{-\left(\lim_{x \rightarrow 1} 2x\right)} \left(\lim_{x \rightarrow 1} e^{2x^2}\right)$$

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Factor out constants:

$$= e^{-2\left(\lim_{x \rightarrow 1} x\right)} \left(\lim_{x \rightarrow 1} e^{2x^2}\right)$$

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The limit of  $x$  as  $x$  approaches 1 is 1:

$$= \frac{\lim_{x \rightarrow 1} e^{2x^2}}{e^2}$$

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Using the continuity of  $e^{2x^2}$  at  $x = 1$  write  $\lim_{x \rightarrow 1} e^{2x^2}$  as  $e^{\lim_{x \rightarrow 1} 2x^2}$ :

$$= e^{\lim_{x \rightarrow 1} 2x^2 - 2}$$

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Factor out constants:

$$= e^{2\left(\lim_{x \rightarrow 1} x^2\right) - 2}$$

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Using the power law, write  $\lim_{x \rightarrow 1} x^2$  as  $\left(\lim_{x \rightarrow 1} x\right)^2$ :

$$= e^{2\left(\lim_{x \rightarrow 1} x\right)^2 - 2}$$

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The limit of  $x$  as  $x$  approaches 1 is 1:

Answer:

$$= 1$$