

# Calculus

W 29 February 2012

RESET THE  
SESSION

SET THE  
PARTICIPANT  
LIST

PLUG IN THE  
RECEIVER

Look at an unused file

Cover the look ahead

Topics covered are in bounds

Boxed answers agree with  
TurningPoint answers

Points agree with  
TurningPoint points

Points total to 100

QUIZ  
FOLLOWS

$$\left[ \frac{d}{dx} \right] [(\cos y) + 2y^3] = ??$$

(a)  $-(\sin y) + 6y^2$

(b)  $-(\sin y') + 6(y')^2$

(c)  $-(\sin y)y' + 6y^2$

(d) none of the above

Correct answer:  $-(\sin y)y' + 6y^2y'$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

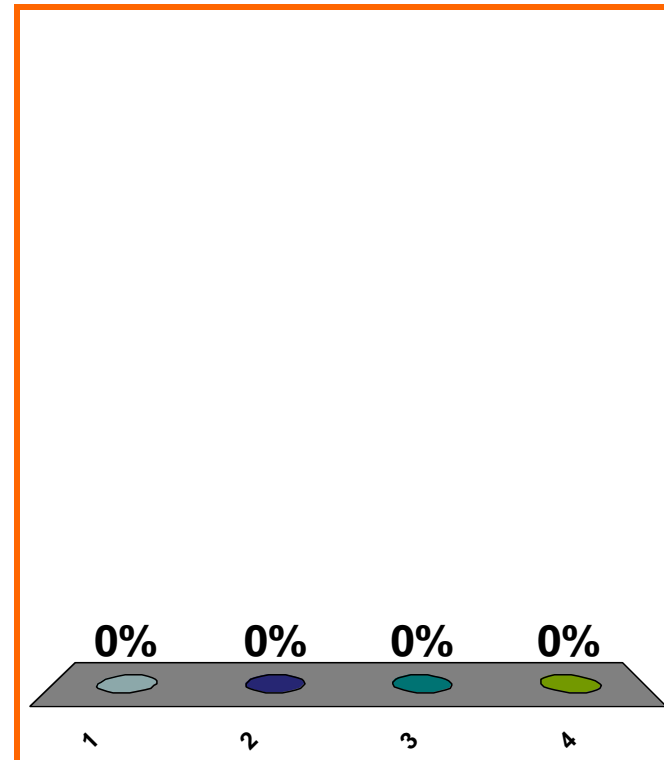
$$[d/dx][\tan(xy)] = ??$$

(a)  $-\sec^2(xy)[y + xy']$

(b)  $\sec^2(xy)[y + xy']$

(c)  $-\sec^2(xy)[y + x]$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0430

0 pts

6

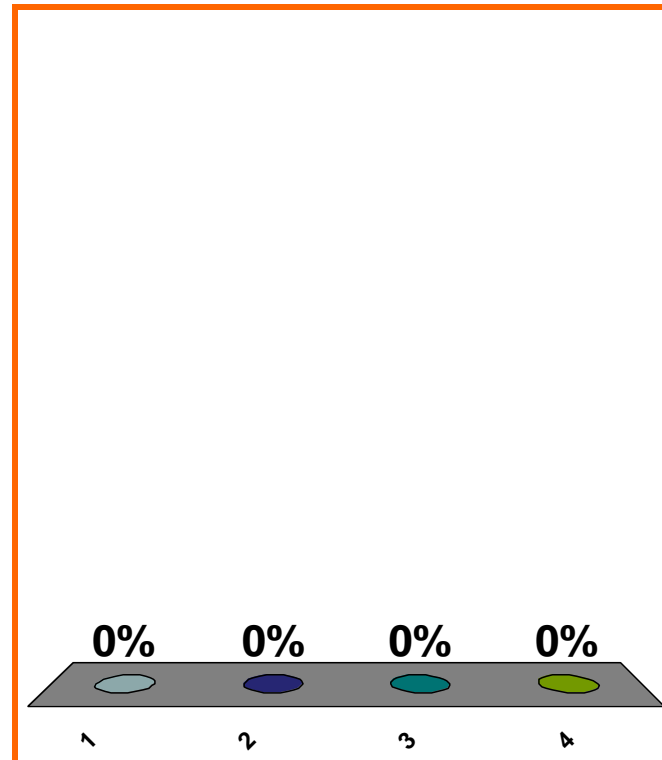
$$[d/dx][xe^y + y] = ??$$

(a)  $e^y + xe^y + 1$

(b)  $e^y + xe^y y' + y'$

(c)  $e^y + xe^y + y'$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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Topic 0430

0 pts

7

$$\begin{aligned} [d/dx][xe^y + y] &= e^y + xe^y y' + y' \\ &= e^y + (xe^y + 1)y' \end{aligned}$$

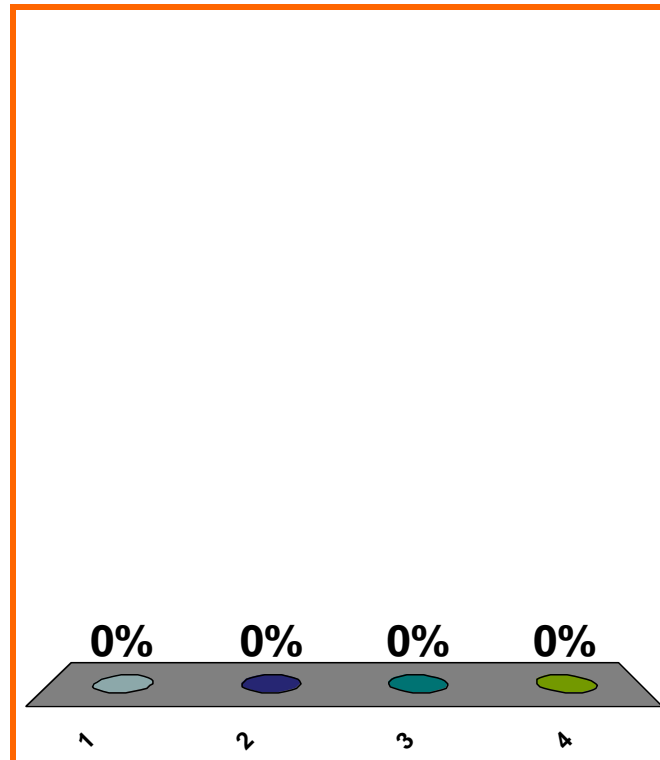
$$\begin{aligned} xe^y + y &= 1 \\ y' &= ?? \end{aligned}$$

(a)  $e^y / (xe^y + 1)$

(b)  $-e^y / (xe^y + 1)$

(c)  $(1 - e^y) / (xe^y + 1)$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0430

0 pts

8



$$y' = -e^y / (xe^y + 1)$$

$$xe^y + y = 1$$

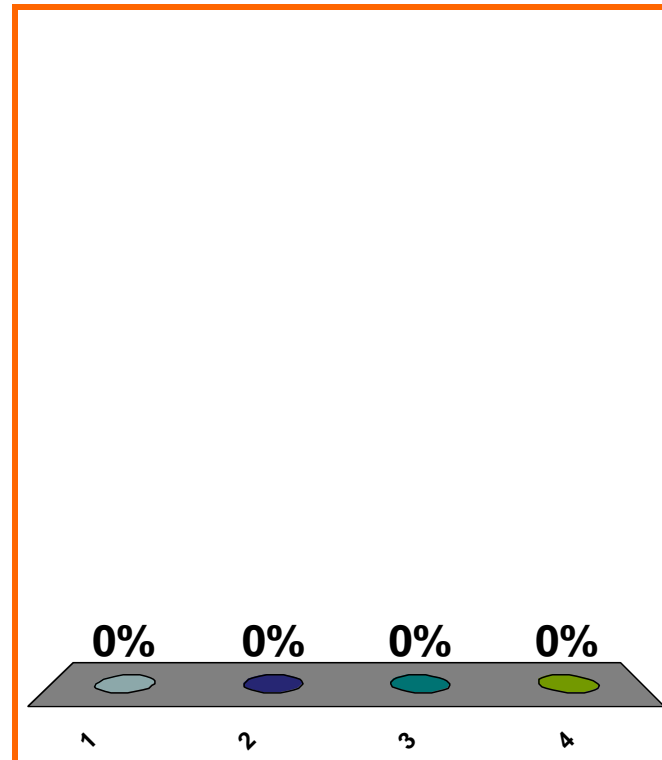
slope at (0, 1)?

(a) 0

(b) -1

(c)  $-e$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

$$h'(x) = [f'(x)][g(x)] + [f(x)][g'(x)]$$

$$h'(4) = [f'(4)][g(4)] + [f(4)][g'(4)]$$

$$f(4) = 7, f'(4) = 1$$

$$g(4) = 6, g'(4) = 3$$

$$h(x) = [f(x)][g(x)]$$

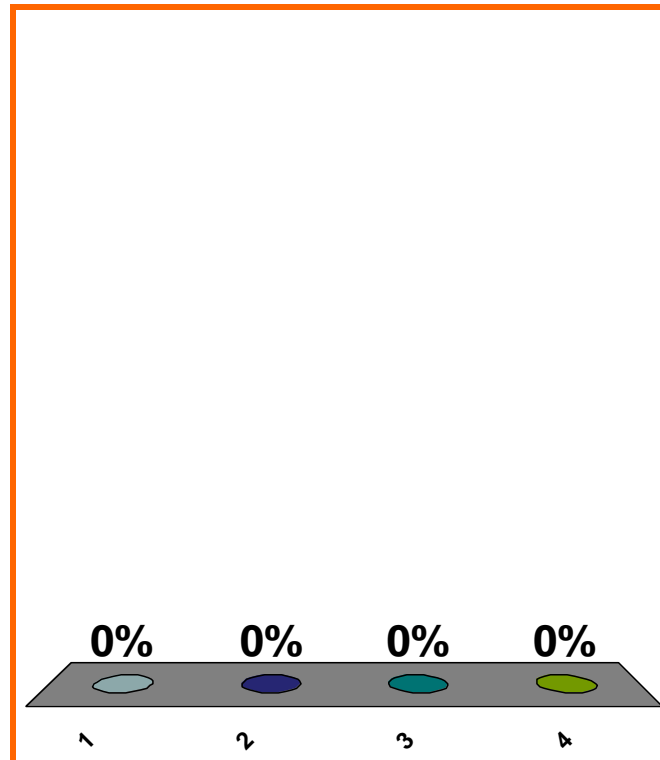
$$h(4) = ??, h'(4) = ??$$

(a) 42, 3

(b) 13, 27

(c) 42, 27

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0340

0 pts

10

$$h'(x) = [g'(f(x))][f'(x)]$$
$$h'(4) = [g'(f(4))][f'(4)]$$

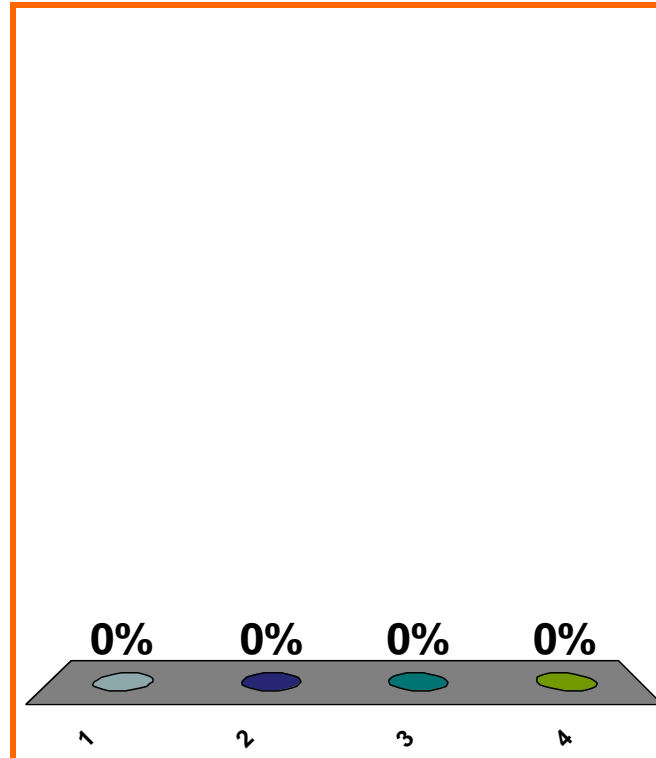
$$f(4) = 7, f'(4) = 1$$
$$g(7) = 6, g'(7) = 3$$
$$h(x) = g(f(x))$$
$$h(4) = ??, h'(4) = ??$$

(a) 42, 27

(b) 6, 27

(c) 6, 3

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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Topic 0370

0 pts

$$f(g(x)) = x$$

$$[f'(g(x))][g'(x)] = 1$$

$$[f'(g(7))][g'(7)] = 1$$

$$g = f^{-1}$$

$$f(4) = 7, g(7) = 4$$

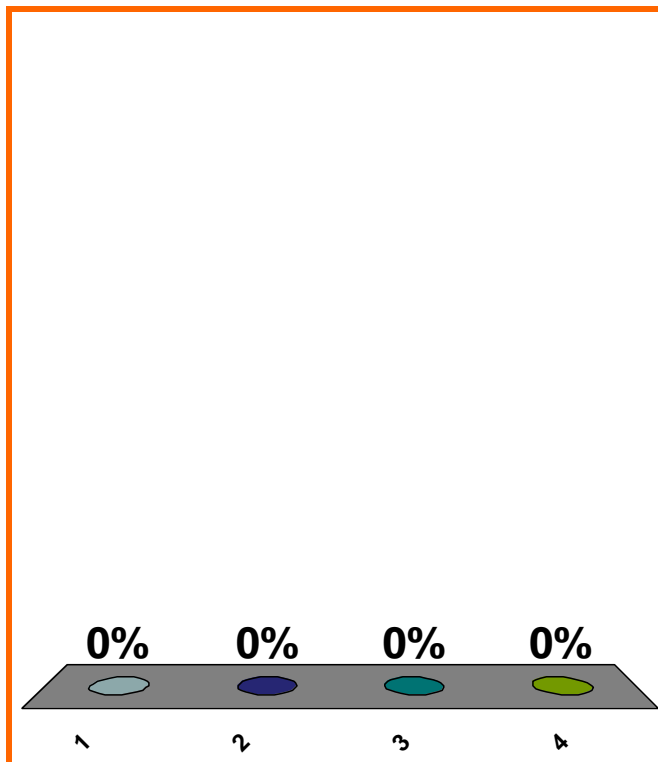
$$f'(4) = 2, g'(7) = ??$$

(a) 1/2

(b) 4

(c) 0

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0430

0 pts

12

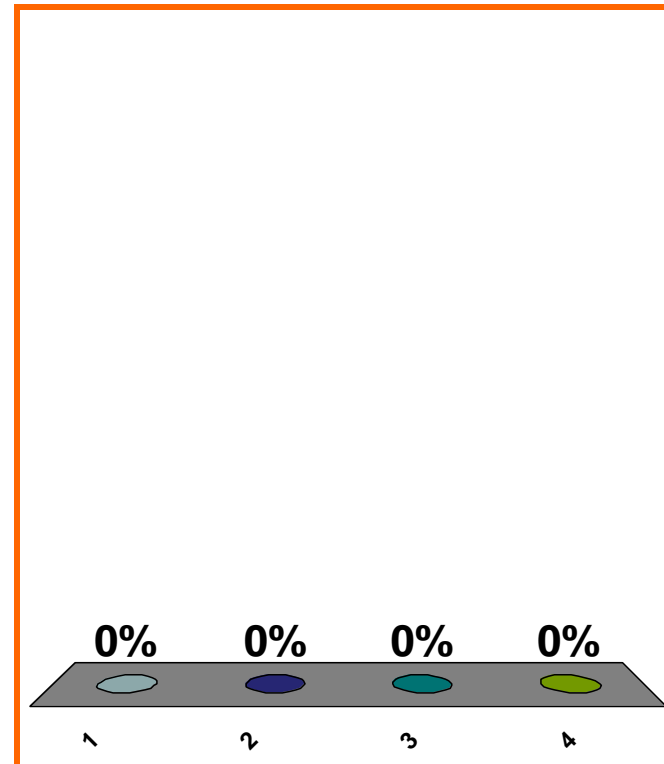
$$\lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x - 1}{2x} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x}{2}$$

(a)  $\infty$

(b)  $\frac{1}{2}$

(c) DNE

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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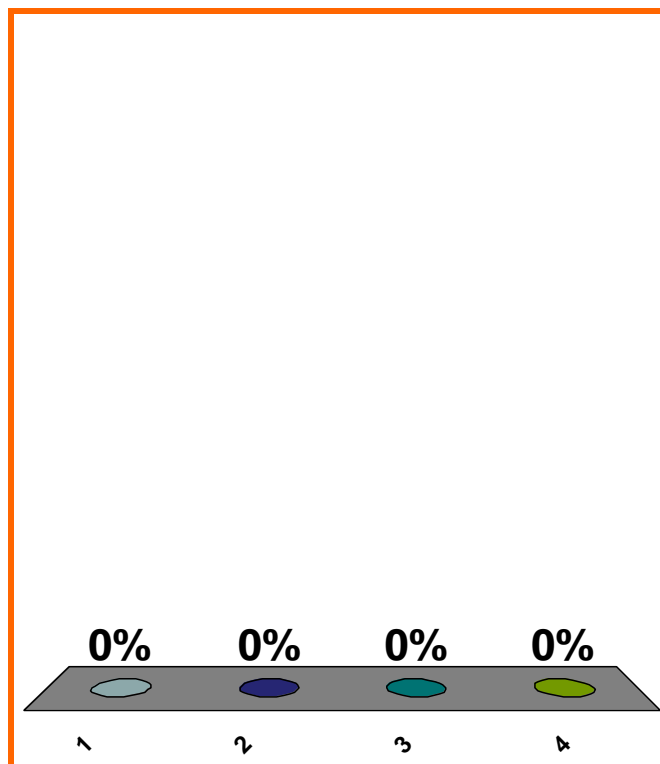
$$\lim_{x \rightarrow 0} \frac{e^x - x}{x^3}$$

(a)  $\infty$

(b)  $\lim_{x \rightarrow 0} \frac{e^x - 1}{2x}$

(c) DNE

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

T or F:

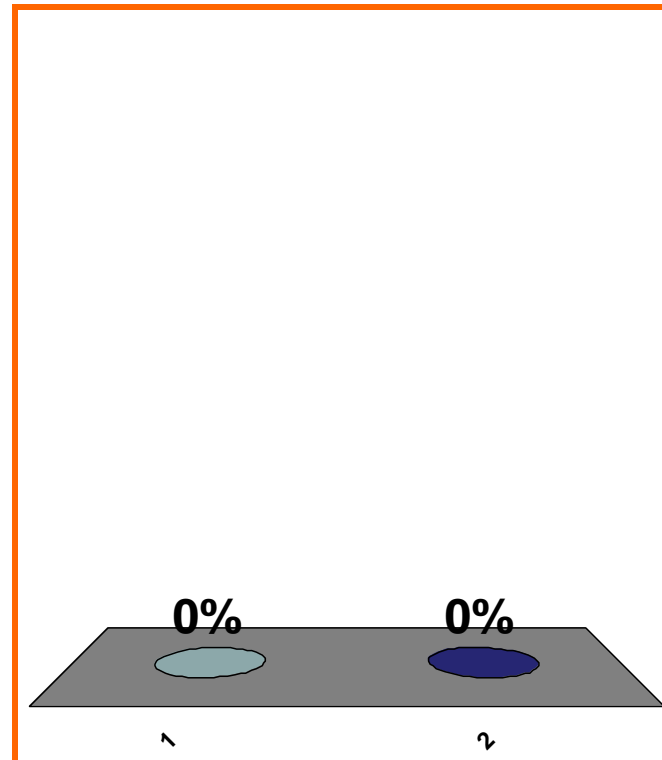
$$f' > 0 \text{ on } (2, 3)$$



$$f \text{ incr. on } (2, 3)$$

(a) True

(b) False



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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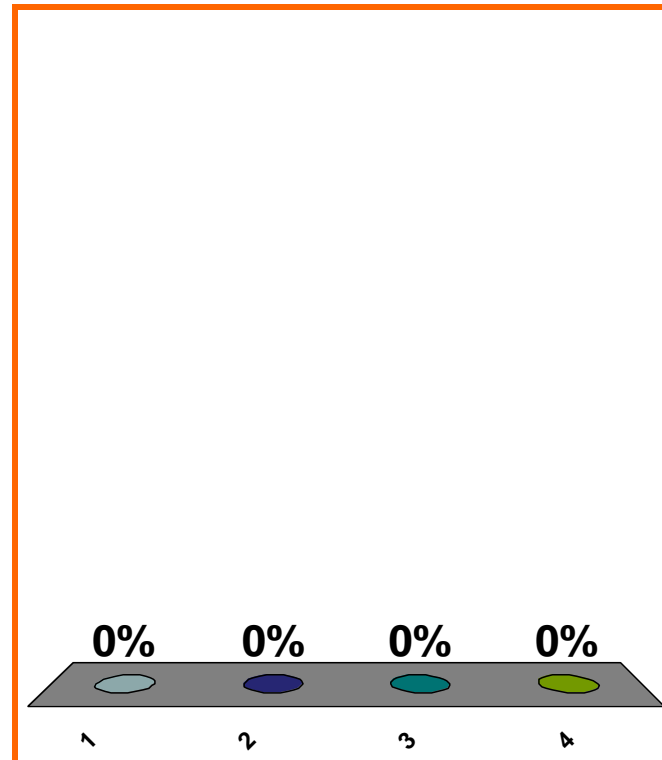
$$\frac{d}{dx} [\ln 5] = ??$$

(a) DNE

(b) 1/5

(c) 0

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0310

0 pts

16



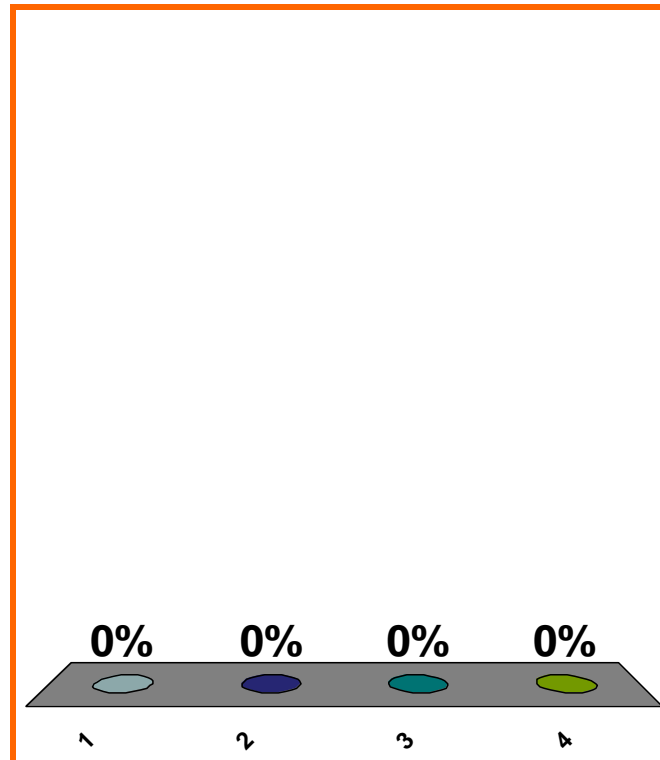
$$\frac{d}{dx} [(\ln 5)x] = ??$$

(a)  $\ln 5$

(b) 0

(c)  $x/5$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0310

0 pts

17

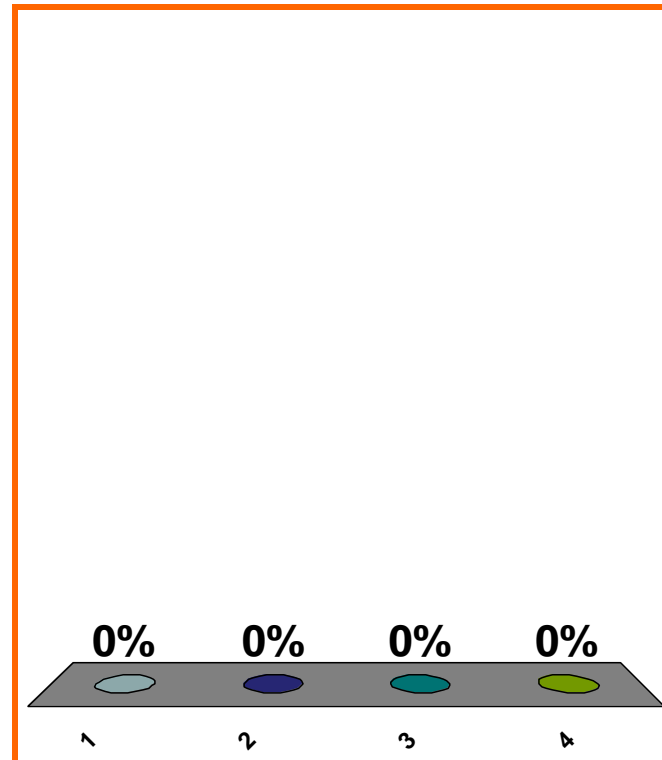
$$(d/dx)(\ln |x|)$$

(a)  $1/x, x > 0$

(b)  $|1/x|$

(c)  $1/x$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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$$(d/dx)(\arctan x) = \frac{1}{1+x^2}$$

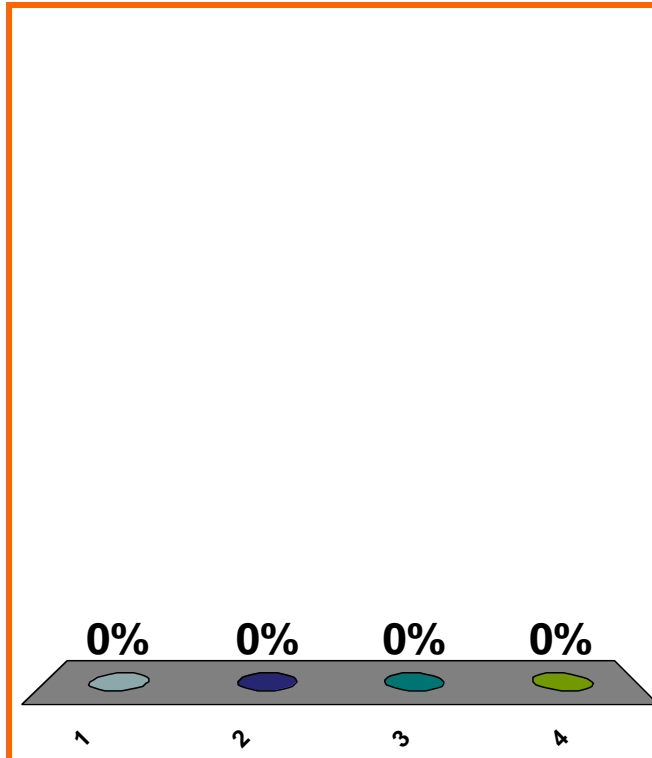
$$(d/dx)(\arctan e^x) = ??$$

$$(a) \frac{e^x}{1+(e^x)^2}$$

$$(b) (\operatorname{arcsec}^2 e^x)(e^x)$$

$$(c) \frac{1}{1+(e^x)^2}$$

(d) none of the above



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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Topic 0370

0 pts

19

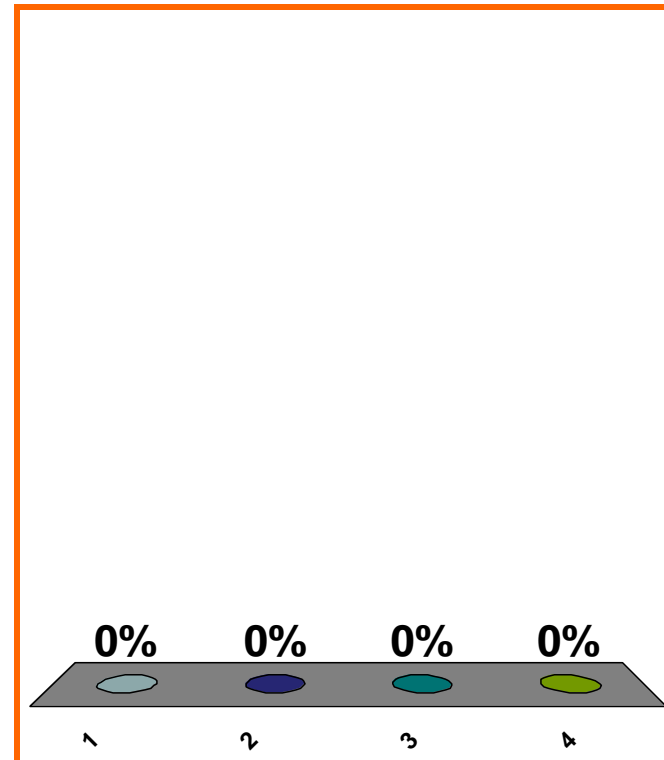
$$(d/dx)(e^{-2x})$$

(a)  $e^{-2x}$

(b)  $e^{-2}$

(c)  $-2e^{-2x}$

(d) none of the above



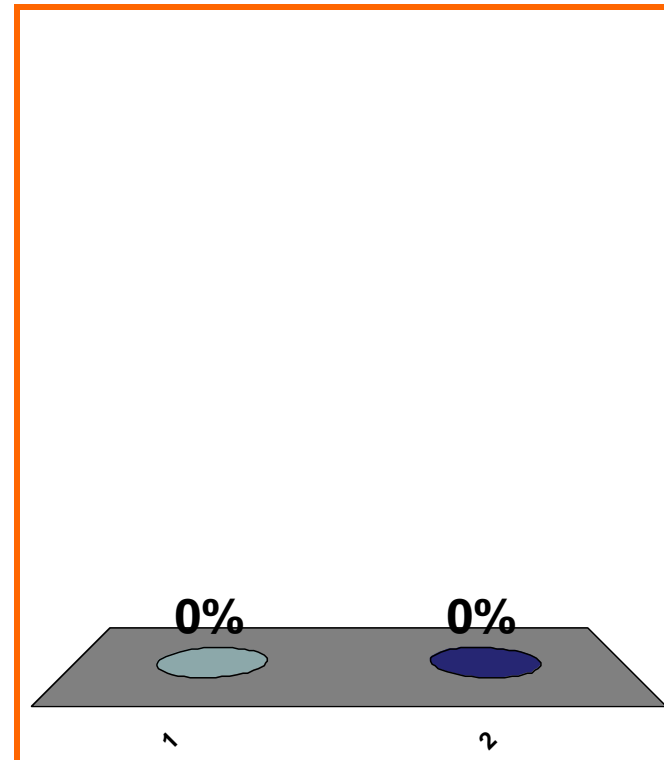
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

T or F:

$$\forall x \in \mathbb{R}, \quad \ln(e^x) = x$$

(a) True

(b) False



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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precalc

0 pts

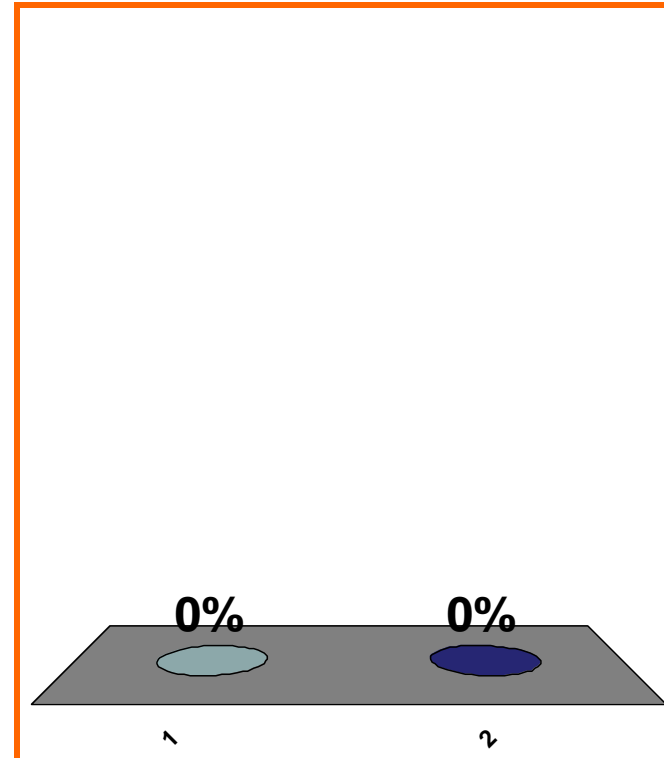
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T or F:

$$\forall x \in \mathbb{R}, \quad e^{\ln x} = x$$

(a) True

(b) False



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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precalc

0 pts

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# LOOK AHEAD

$$\int 3x^2 + \frac{7}{x} - \frac{\pi}{\sqrt{x}} dx$$

# CURRENT (indet forms)

$$f(x) \underset{x \rightarrow a}{\rightarrow} \Rightarrow \ln(1 + [f(x)]) \underset{x \rightarrow a}{\sim} f(x)$$

$$\lim_{x \rightarrow 0} (\cos x)^{\csc^2 x}$$

$$\lim_{x \rightarrow \infty} \left( \sqrt{x^2 + x} - \sqrt{x^2 - 7x} \right)$$

$$\lim_{x \rightarrow 0} \left( \frac{\cos x}{x^2} - \frac{\cot x}{x} \right)$$

# LOOK BACK

derivs w.r.t.  $x$  of exprs of  $y$

# CURRENT (implicit differentiation)

$$\sin(xy) = 4x^2 - 7xy + y^2e^x$$

Slope of tan line to  $x^4 + y^4 = 17$  at  $(1, 2)$

Eq'n of tan line to  $x^4 - 7xy + y^4 = 3$  at  $(1, 2)$



$$f(x) = 2x \quad \Rightarrow \quad f(s+t) = (f(s)) + (f(t))??$$

$$f(x) = 3x \quad \Rightarrow \quad f(s+t) = (f(s)) + (f(t))??$$

$$f(x) = 4x+1 \quad \Rightarrow \quad f(s+t) = (f(s)) + (f(t))??$$

limit of quotient = quotient of limits ?

$$e^{\ln x} = x \quad ?$$

$$\ln e^x = x \quad ?$$

$$x^2/x = x \quad ?$$

$$x/x^2 = 1/x \quad ?$$

$$\text{position} = 2t^3 + 5t^2$$

$$\text{velocity at } t = 3 \quad ?$$

SAVE THE  
SESSION  
DATA

RETURN TO  
PRESENTATION