

Calculus

F 1 March 2013

RESET THE
SESSION

SET THE
PARTICIPANT
LIST

PLUG IN THE
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Boxed answers agree with
TurningPoint answers

Points agree with
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Points total to 100

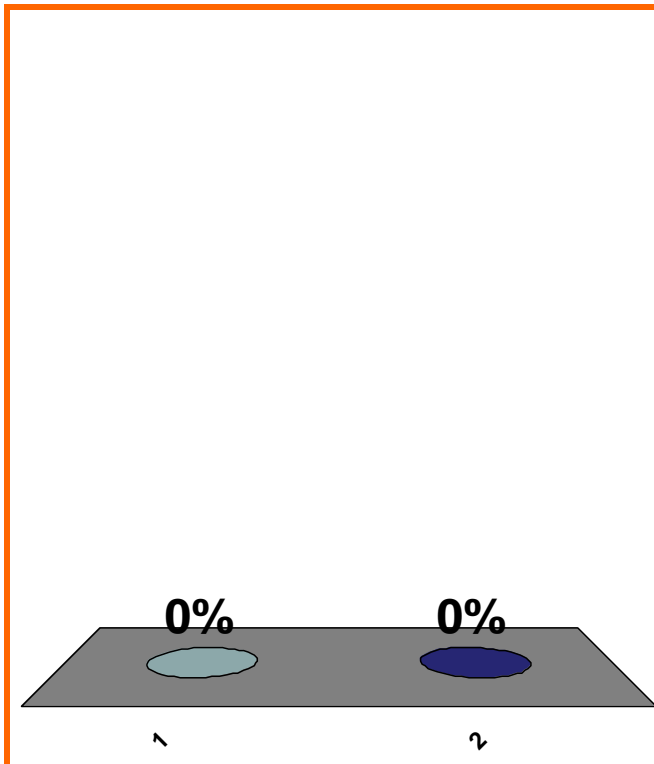
Topics covered are in bounds

QUIZ
FOLLOWS

$$1 + 1 = ??$$

(a) 1

(b) 2



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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arithmetic

0 pts

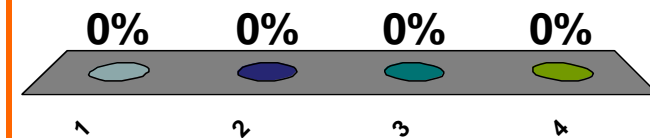
$$(a) x(1+x^2)^{x-1} \left[\frac{d}{dx}(1+x^2) \right]$$

$$\frac{d}{dx} \left[(1+x^2)^x \right]$$

$$(b) x(2x)^{x-1}$$

$$(c) \left[(1+x^2)^x \right] \left[\frac{d}{dx} (x \cdot \ln(1+x^2)) \right]$$

(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 0400

20 pts

6

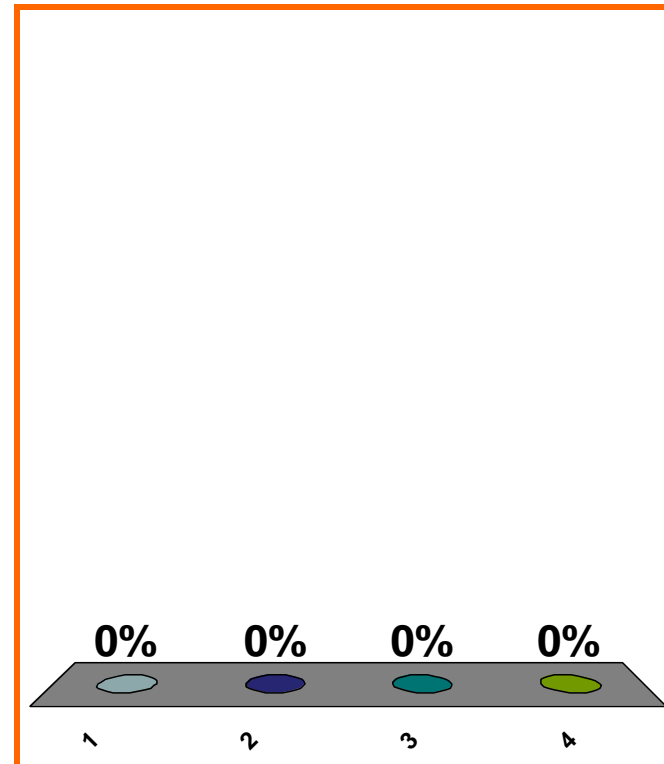
logarithmic derivative w.r.t. x of
 $-x^4 + 5x^2 + 2$

(a) $-4x^3 + 10x$

(b) $\frac{-x^4 + 5x^2 + 2}{-4x^3 + 10x}$

(c) $\frac{-4x^3 + 10x}{-x^4 + 5x^2 + 2}$

(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 0400

20 pts

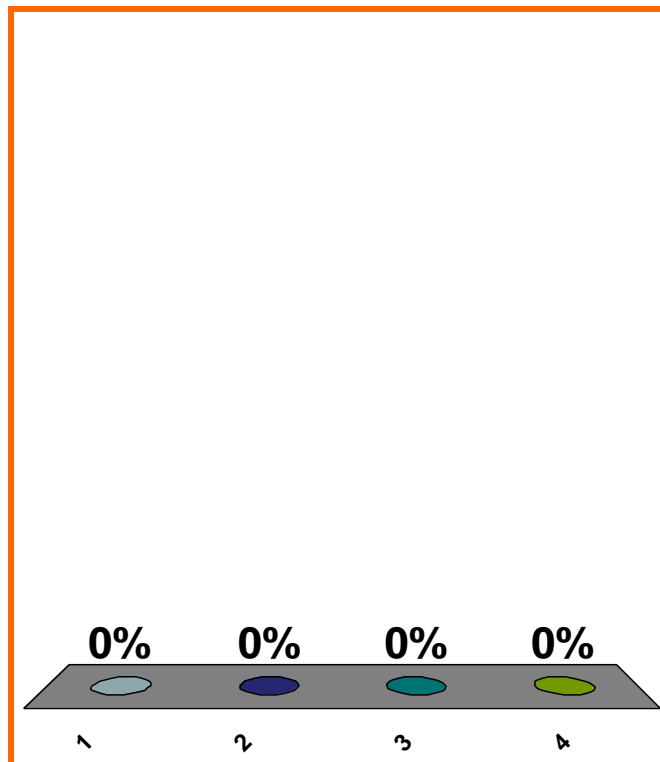
$$\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^4} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x - 1}{4x^3} = ??$$

(a) ∞

(b) $\lim_{x \rightarrow 0} \frac{e^x}{12x^2}$

(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
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 0410

20 pts

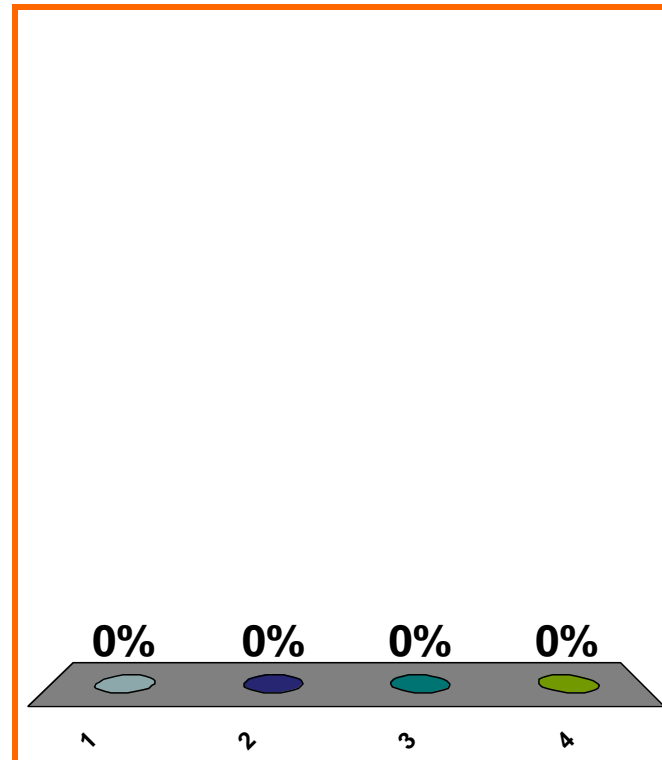
$$\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^4} = \lim_{x \rightarrow 0} \frac{e^x - 1}{4x^3} = \lim_{x \rightarrow 0} \frac{e^x}{12x^2} = ??$$

(a) $\lim_{x \rightarrow 0} \frac{e^x}{24x}$

(b) ∞

(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

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Topic 0410

20 pts

$$(d/dx)(\arctan x) = \frac{1}{1+x^2}$$

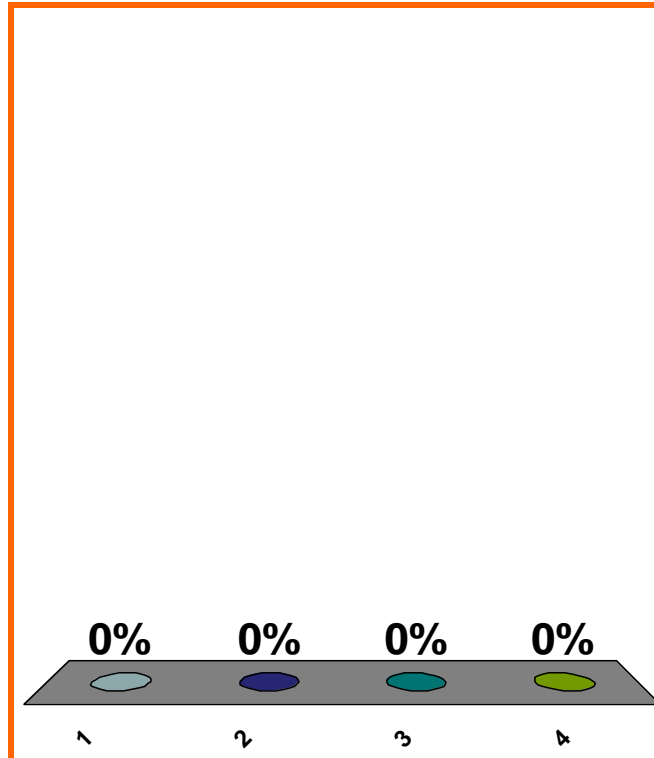
$$(d/dx)(\arctan e^x) = ??$$

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

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

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

(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

10 pts

10

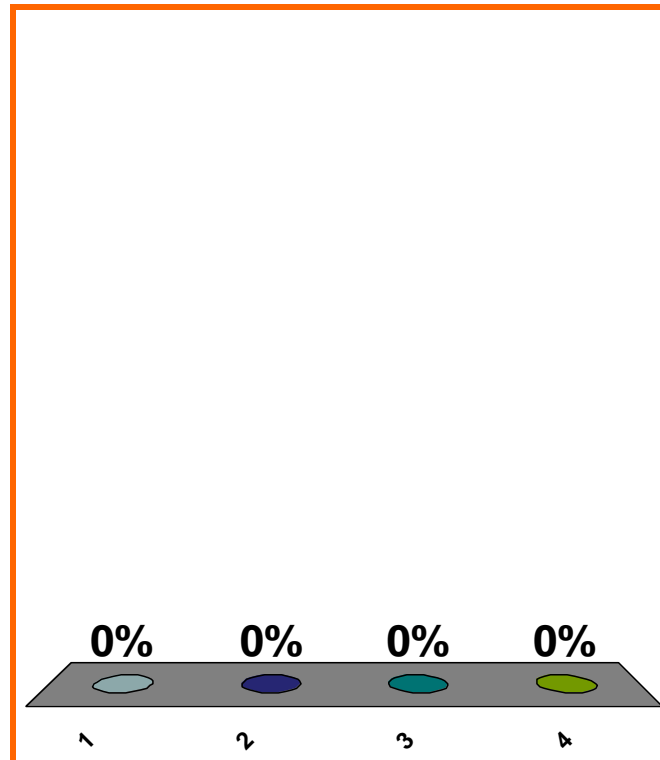
$$\frac{d}{dx} [7^{1/2}] = ??$$

(a) 0

(b) $[1/2] [7^{-1/2}]$

(c) $7^{1/2}(\ln 7)$

(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

10 pts

11

END
QUIZ

END
CLASS

Principle of log diff:

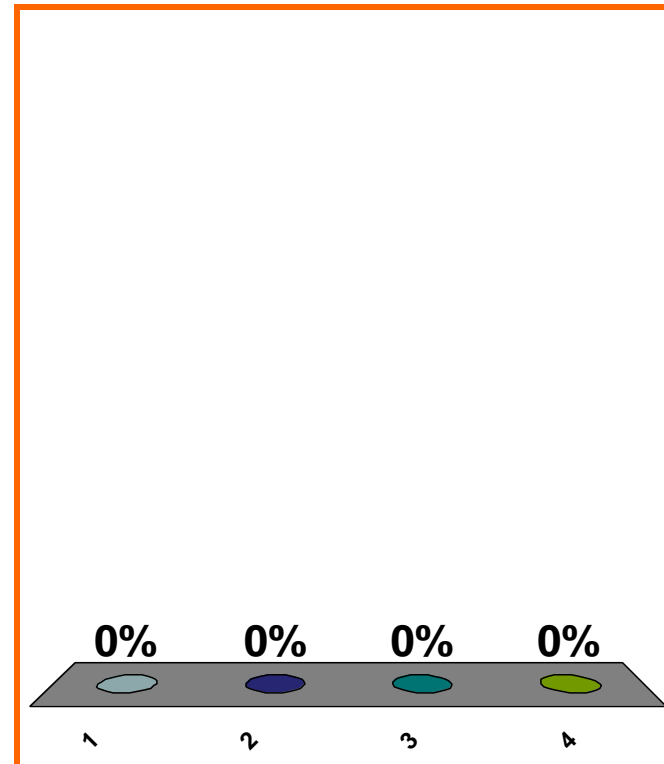
$$f'(x) = ??$$

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

(b) $[f'(x)]/[f(x)]$

(c) $[f(x)][(d/dx)(\ln |f(x)|)]$

(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

Find $\log_{10}(7)$,

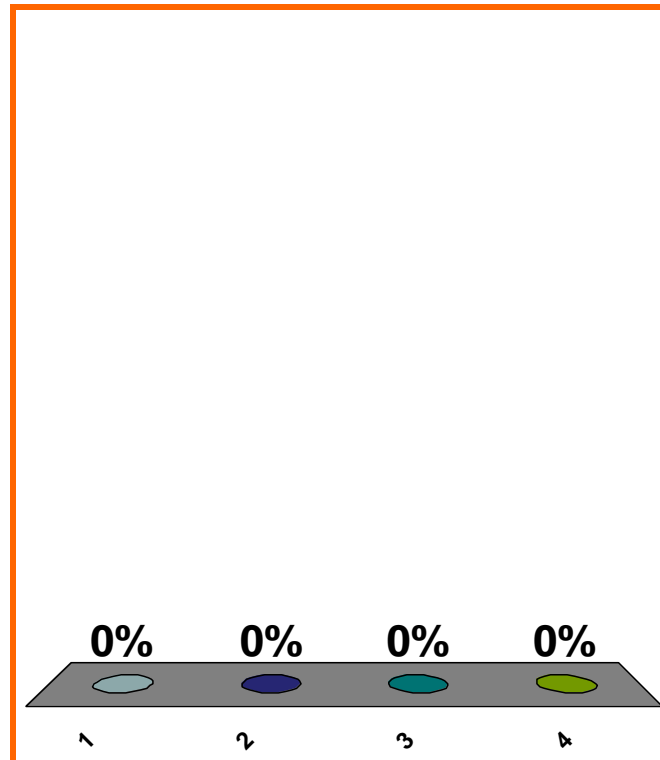
i.e., solve $10^{??} = 7$.

(a) $\frac{\ln 10}{\ln 7}$

(b) $\frac{\ln 7}{\ln 10}$

(c) $\ln(7/10)$

(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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precalc

0 pts

15

Find $\log_{10}(x)$,

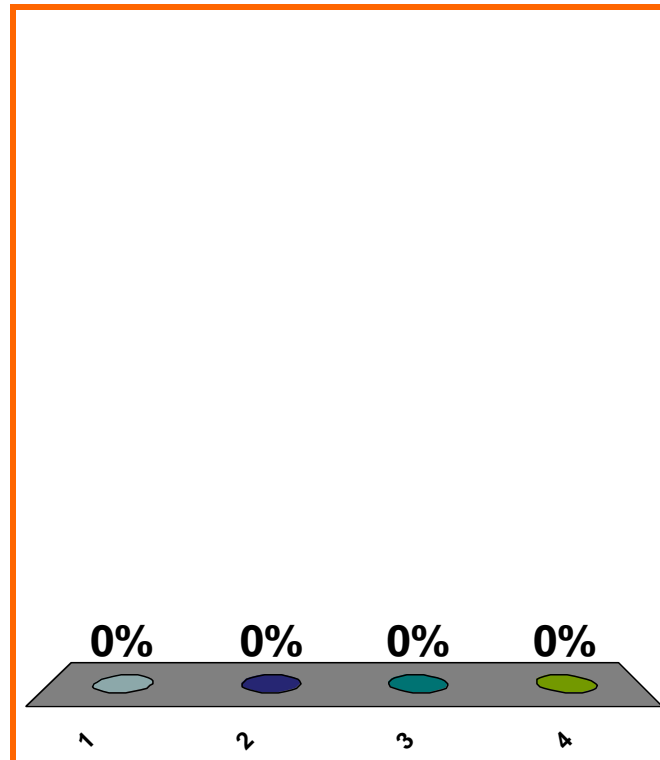
i.e., solve $10^{??} = x$.

(a) $\frac{\ln 10}{\ln x}$

(b) $\frac{\ln x}{\ln 10}$

(c) $\ln(x/10)$

(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

$$\log_{10}(x) = \frac{\ln x}{\ln 10}$$

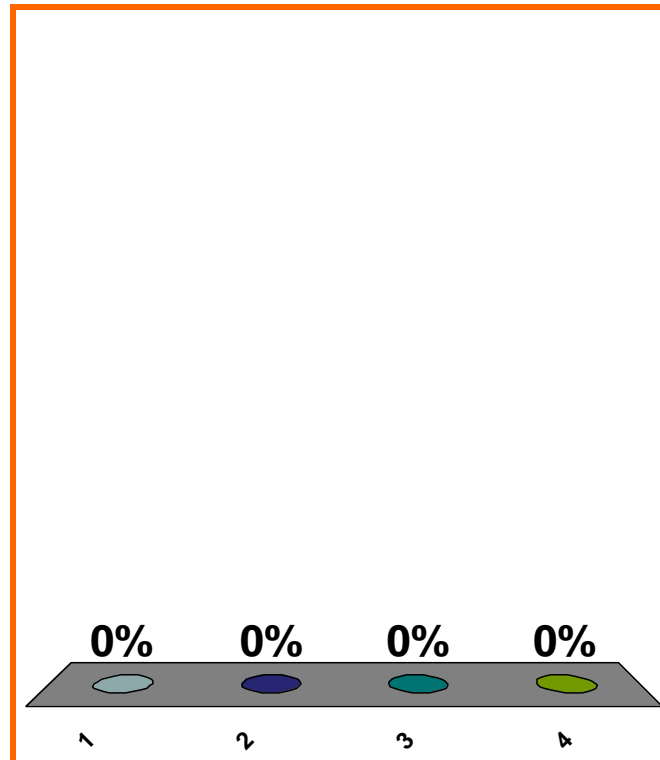
$$\frac{d}{dx} [\log_{10}(x)] = ?? \quad x > 0$$

(a) $\frac{1/x}{\ln 10}$

(b) $\frac{1/x}{1/10}$

(c) $\frac{\ln x}{1/10}$

(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 0400

0 pts

17

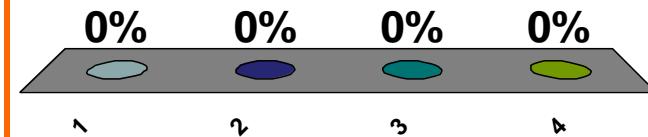
$$\lim_{x \rightarrow 0} \left[\frac{e^{2x} - 1}{\ln(1 + x)} \right] \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} [??]$$

(a)
$$\frac{[\ln(1 + x)][2e^{2x}] - [e^{2x} - 1][1/(1 + x)]}{[\ln(1 + x)]^2}$$

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

(c) l'Hôpital does **not** apply.

(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 0410

0 pts

18

$$\lim_{x \rightarrow \infty} \left[\frac{\sin x}{x} \right] \stackrel{\text{L'H}}{=} \lim_{x \rightarrow \infty} [??]$$

(a) $\frac{-\cos x}{1}$

(b) $\frac{\cos x}{1}$

(c) L'Hôpital does **not** apply.

(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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$$\lim_{x \rightarrow \infty} \frac{x}{e^x} = ??$$

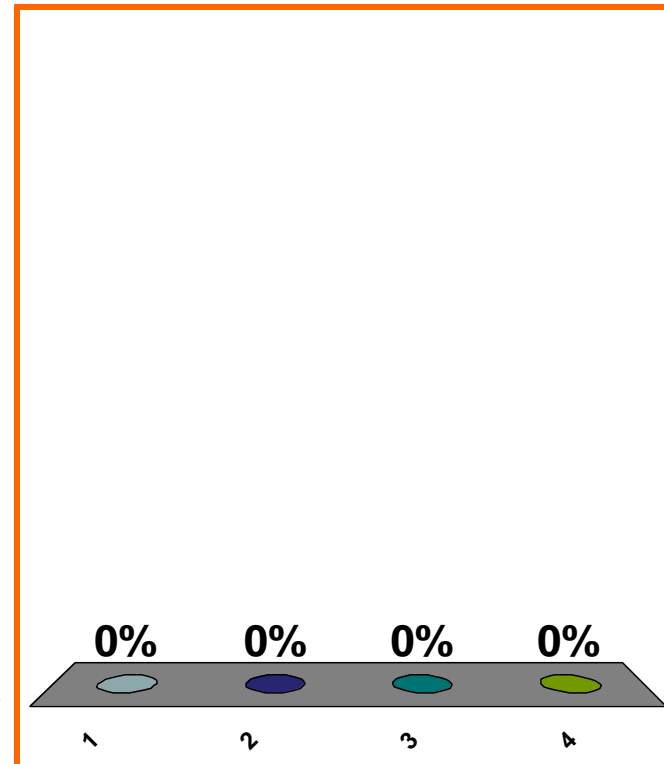
(a) $\lim_{x \rightarrow \infty} \frac{(e^x)(1) - (x)(e^x)}{e^{2x}}$

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

(c) $\lim_{x \rightarrow \infty} \frac{(e^x)(1) - (x)(xe^{x-1})}{e^{2x}}$

(d) none of the above

Correct answer: $\lim_{x \rightarrow \infty} \frac{1}{e^x}$



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

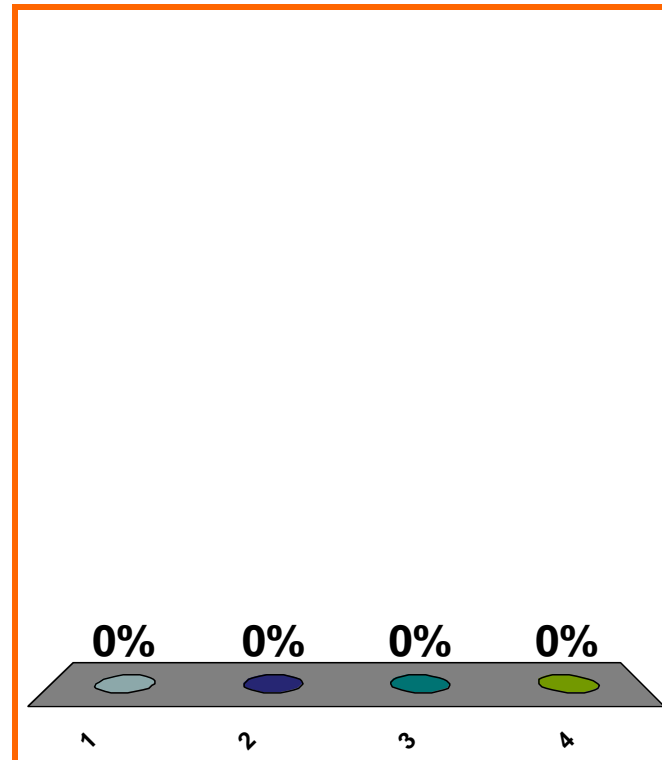
$$\lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2} = ??$$

(a) ∞

(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

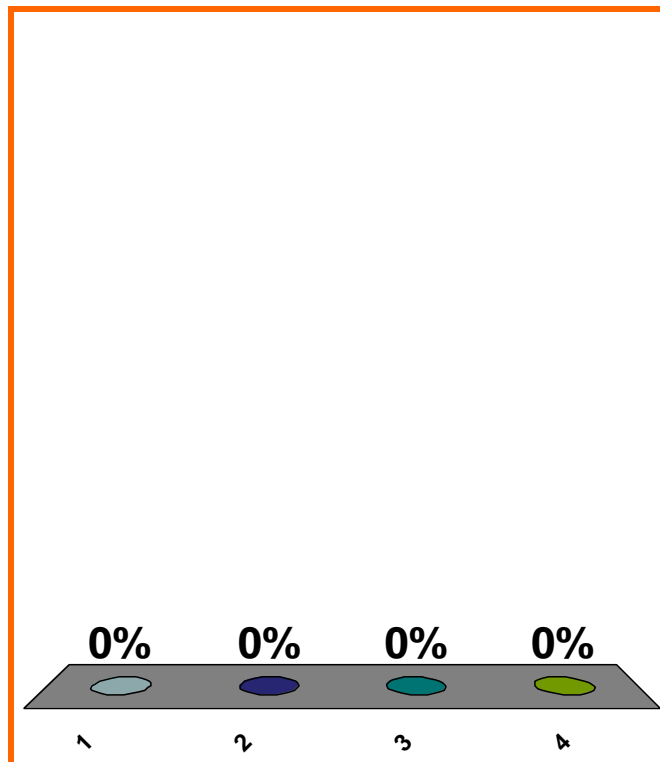
$$\lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x - 1}{2x} = ??$$

(a) $\lim_{x \rightarrow 0} \frac{e^x}{2}$

(b) $\lim_{x \rightarrow 0} \frac{[2x][e^x] - [e^x - 1][2]}{4x^2}$

(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
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

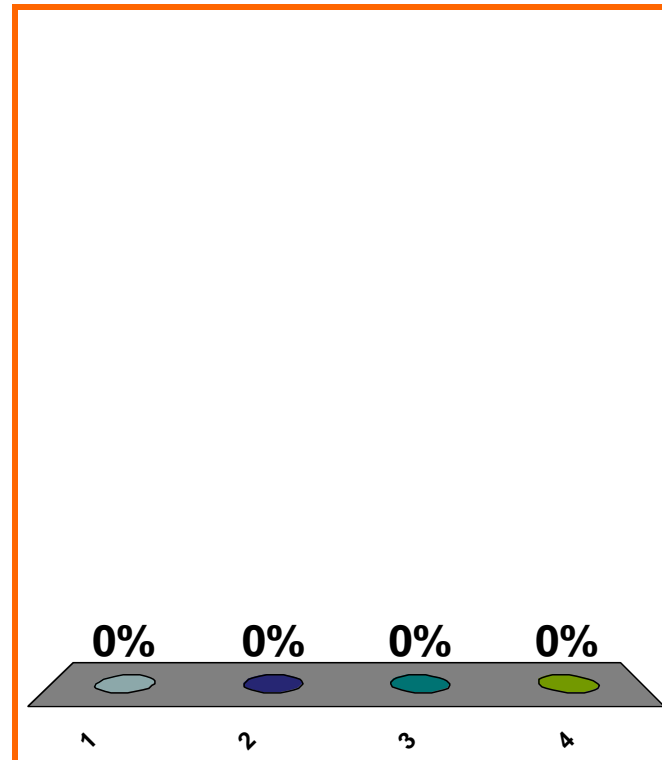
$$\lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x - 1}{2x} \stackrel{\text{L'H}}{=} \lim_{x \rightarrow 0} \frac{e^x}{2} = ??$$

(a) ∞

(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
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 0410

0 pts

23

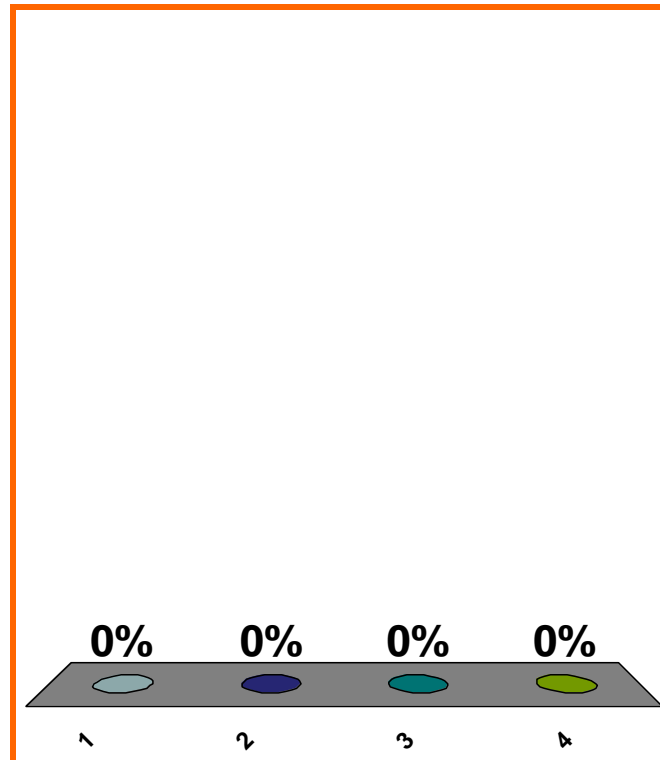
$$\lim_{x \rightarrow 0} \frac{e^x - x}{x^2} = ??$$

(a) ∞

(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

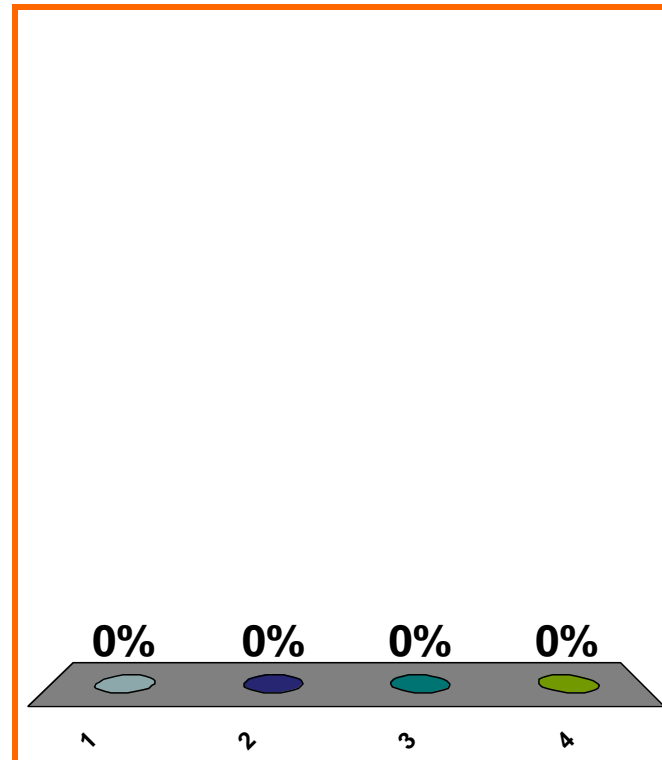
$$\lim_{x \rightarrow 0} \frac{e^x - x}{x^3} = ??$$

(a) ∞

(b) $\lim_{x \rightarrow 0} \frac{e^x - 1}{3x^2}$

(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
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

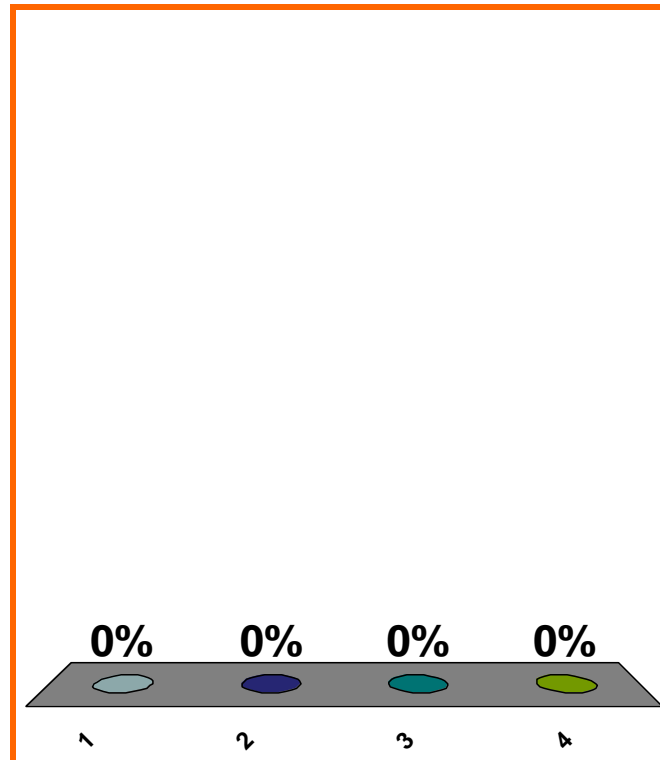
$$\lim_{x \rightarrow 0} \frac{e^x - x}{x^4} = ??$$

(a) ∞

(b) $\lim_{x \rightarrow 0} \frac{e^x - 1}{4x^3}$

(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

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Topic 0410

0 pts

26

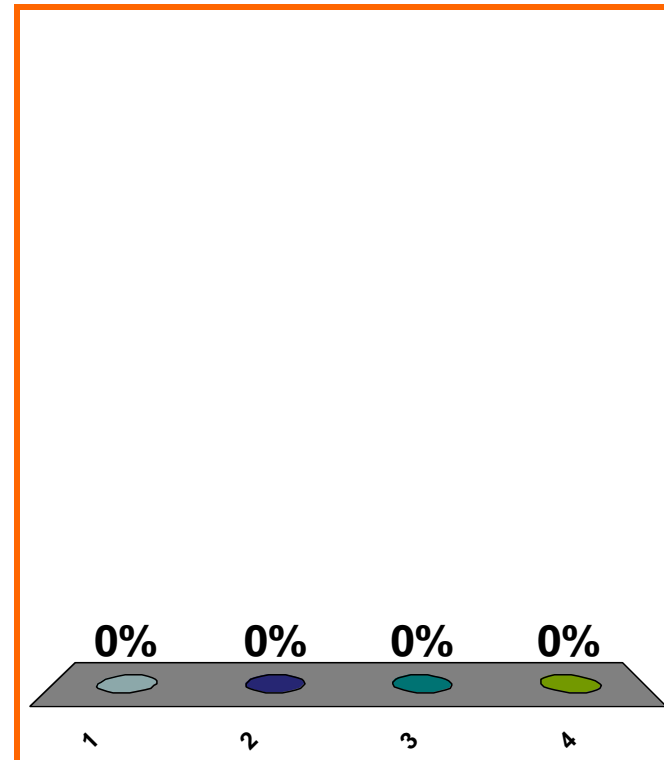
$$\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^4} = ??$$

(a) 0

$$(b) \lim_{x \rightarrow 0} \frac{e^x - 1}{4x^3}$$

(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

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Topic 0410

0 pts

27

$$f(x) = e^x + x^5$$

slope of tangent line at $(1, e + 1)$?

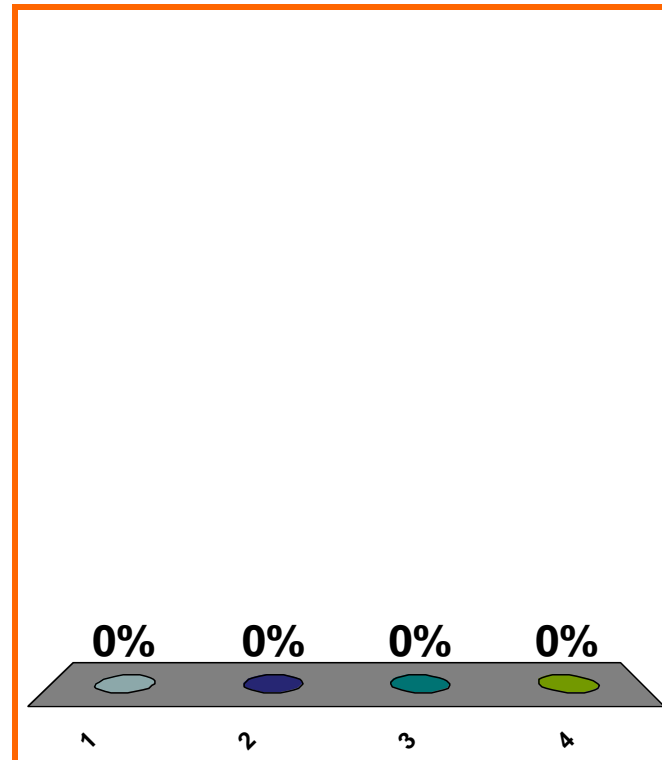
$$f'(x) = e^x + 5x^4$$

(a) $e + 1$

(b) $e + 5$

(c) $e^x + 5x^4$

(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

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

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

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

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

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

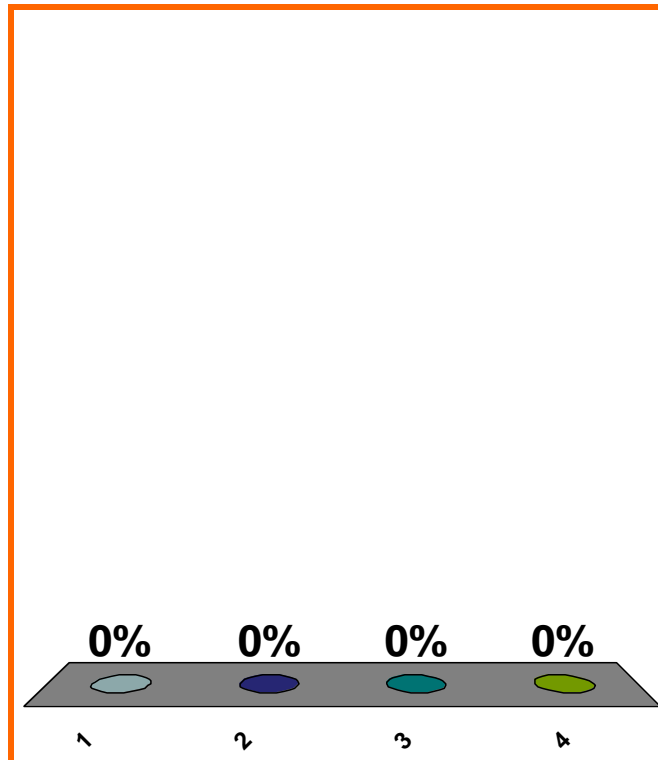
$$h(4) = ??, h'(4) = ??$$

(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

$$h'(x) = \frac{[g(x)][f'(x)] - [f(x)][g'(x)]}{[g(x)]^2}$$

$$h'(4) = \frac{[g(4)][f'(4)] - [f(4)][g'(4)]}{[g(4)]^2}$$

(a) $7/6, (6 - 21)/3^2$

(b) $7/6, (21 - 6)/3^2$

(c) $7/6, (6 - 21)/6^2$

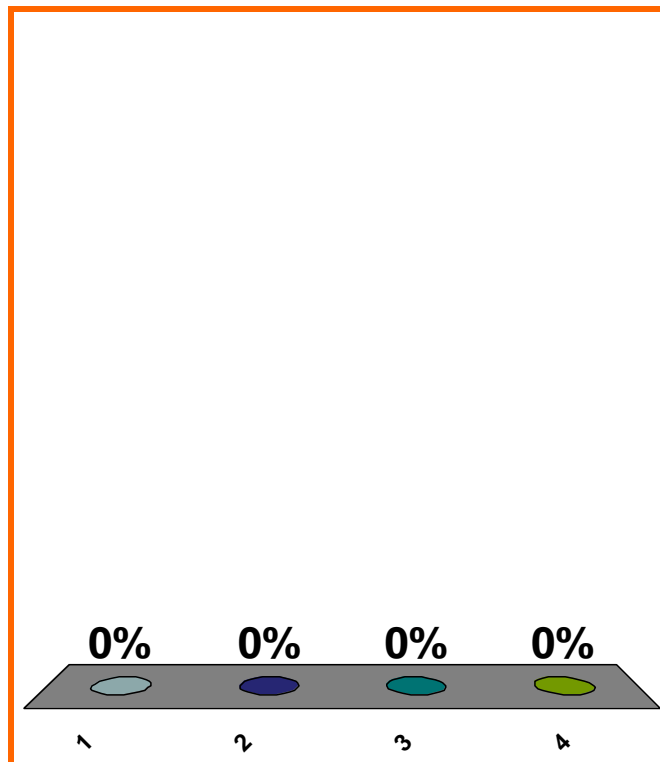
(d) none of the above

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

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

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

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



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 0350

0 pts

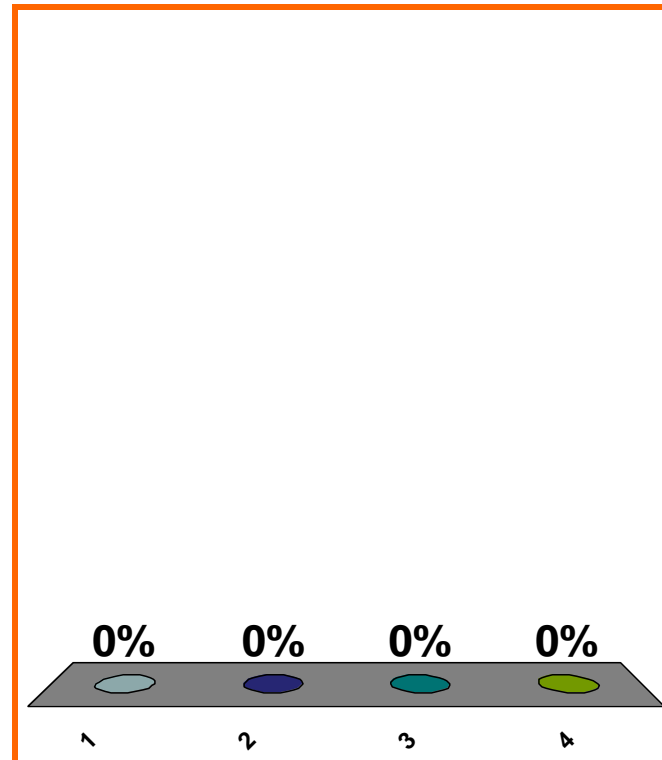
$$\frac{d}{dx} [3 \sin x + 4 \cos x] = ??$$

(a) $(0)(\cos x) + (0)(-\sin x)$

(b) $3 \cos x + 4 \sin x$

(c) $3 \cos x - 4 \sin x$

(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

$$\frac{d}{dx} [x \sin x + 4 \cos x] = ??$$

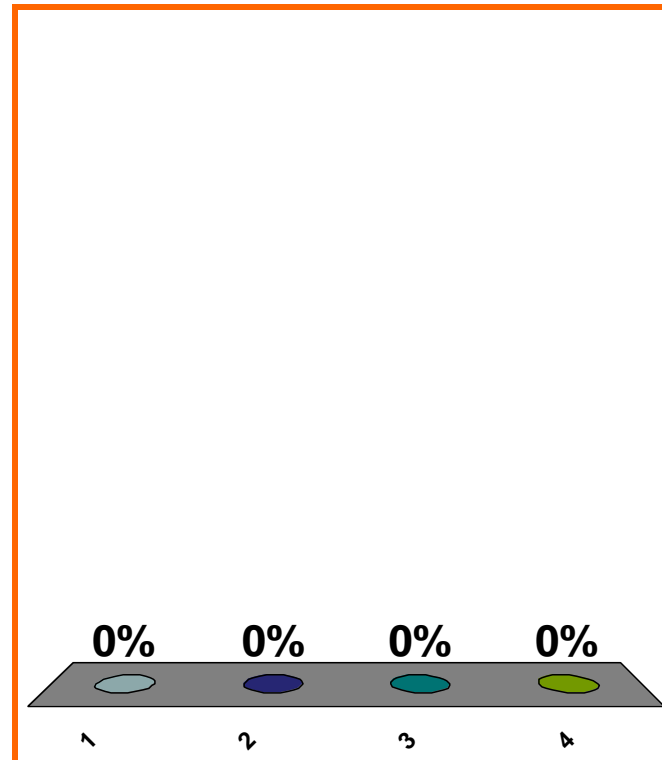
(a) $(1)(\cos x) + (0)(-\sin x)$

(b) $x \cos x + 4 \sin x$

(c) $x \cos x - 4 \sin x$

(d) none of the above

Correct: $\sin x + x \cos x - 4 \sin x$



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 0360

0 pts

32

$$\frac{d}{dx} [\sin x] = \cos x$$

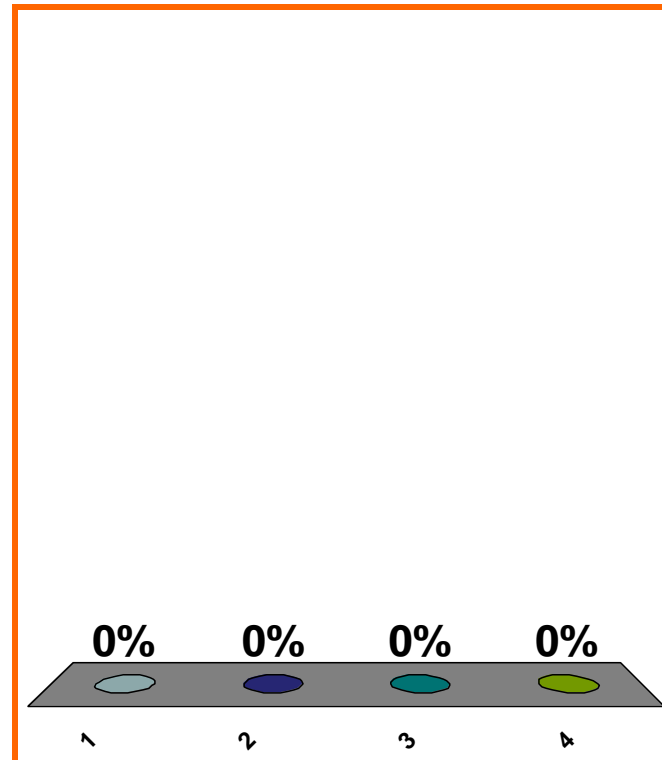
$$\frac{d}{dx} [(x^2)(\sin x)] = ??$$

(a) $(2x)(\cos x)$

(b) $(2x)(-\cos x)$

(c) $(2x)(\sin x) + (x^2)(\cos x)$

(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

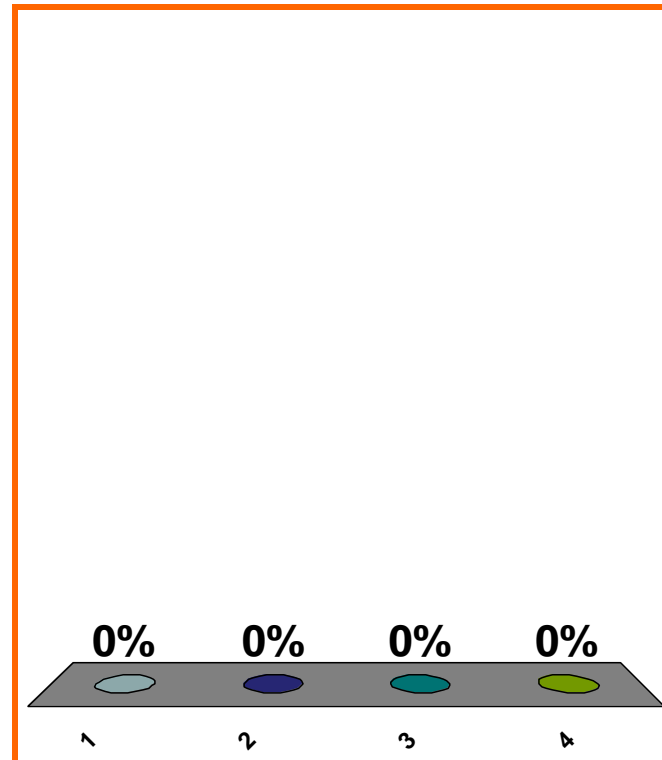
$$\frac{d}{dx} \left[\frac{\sin x}{x} \right] = ??$$

(a) $\frac{(\sin x)(1) - (x)(\cos x)}{x}$

(b) $\frac{(\sin x)(1) - (x)(\cos x)}{x^2}$

(c) $\frac{(x)(\cos x) - (\sin x)(1)}{x^2}$

(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

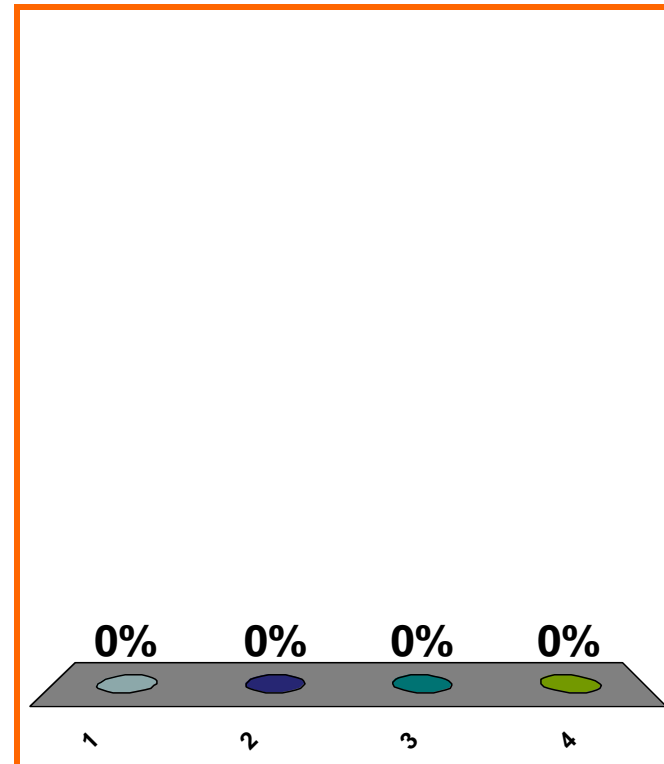
$$\frac{d}{d\theta} [\csc \theta]$$

(a) $-\csc \theta \cot \theta$

(b) $-\csc \theta \cot \theta$

(c) $-\csc^2 \theta$

(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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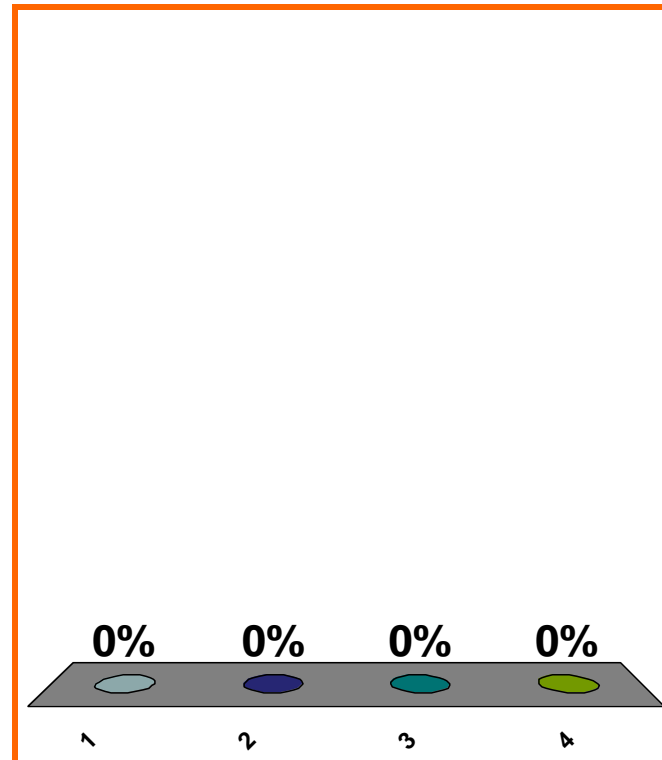
$$\frac{d}{dx} [(x^2)(\sin x)] = ??$$

(a) $(2x)(\cos x) + (x^2)(\sin x)$

(b) $(2x)(\sin x) + (x^2)(\cos x)$

(c) $(2x)(\cos x)$

(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

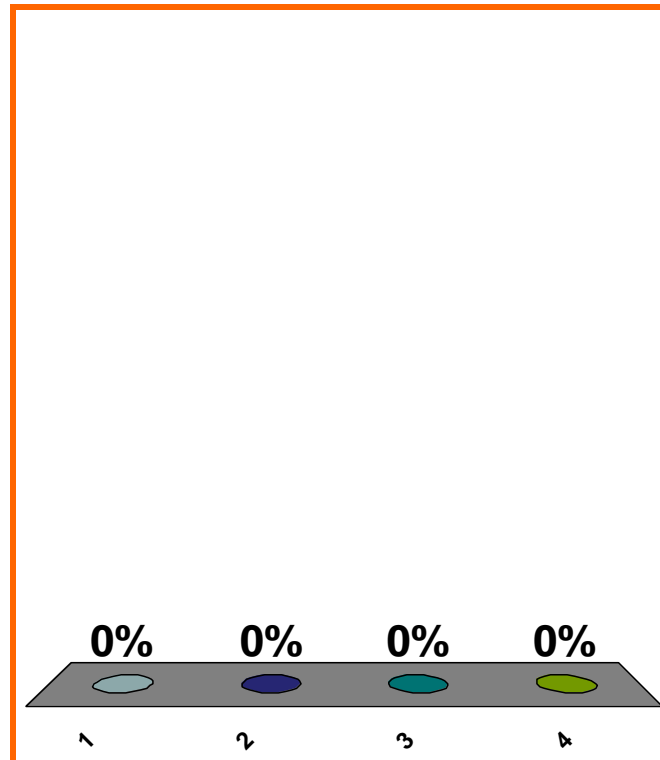
$$\frac{d}{dx} \left[\frac{\sin x}{x^2} \right] = ??$$

$$(a) \frac{(x^2)(\cos x) - (\sin x)(2x)}{x^4}$$

$$(b) \frac{\cos x}{2x}$$

$$(c) \frac{(\sin x)(2x) - (x^2)(\cos x)}{x^4}$$

(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

0 of 5

Topic 0360

0 pts

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$$(d/dx)(\arctan x) = \frac{1}{1+x^2}$$

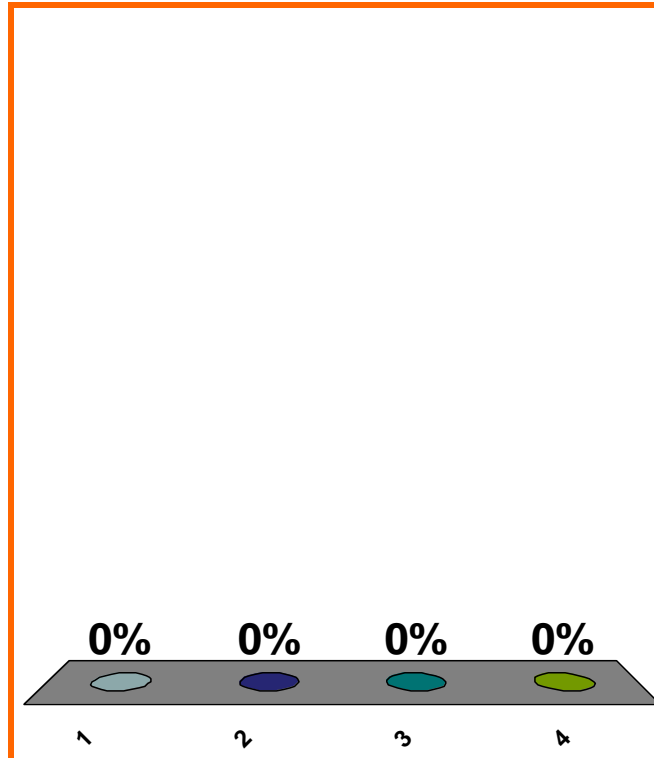
$$(d/dx)(\arctan e^x) = ??$$

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

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

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

(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

0 of 5

Topic 0370

0 pts

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

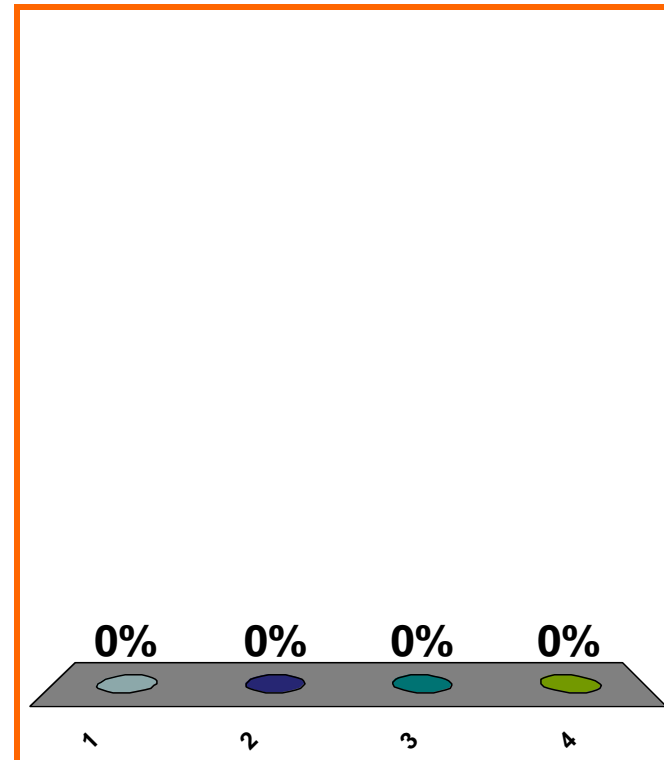
(a) e^{-2x}

(b) e^{-2}

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

(d) none of the above

Correct answer: $-2e^{-2x}$



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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SAVE THE
SESSION
DATA

RETURN TO
PRESENTATION