Calculus
W 10 October 2012

RESET THE SESSION

SET THE PARTICIPANT LIST

PLUG IN THE RECEIVER

Boxed answers agree with TurningPoint answers

Points agree with TurningPoint points

Points total to 100

Topics covered are in bounds

QUIZ
FOLLOWS

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

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

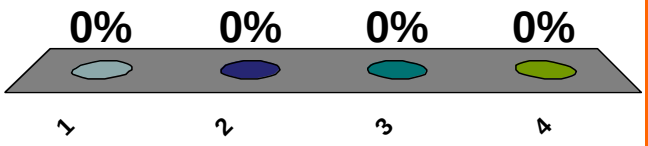
(a) $\dfrac{1}{1+(e^x)^2}$

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

(c) $\dfrac{1}{1-(e^x)^2}$

(d) none of the above

Correct answer: $\dfrac{e^x}{1+(e^x)^2}$



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

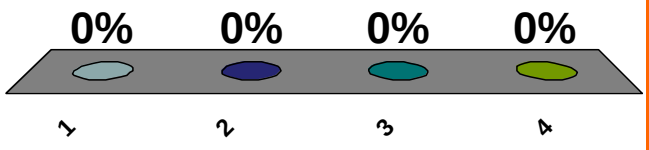
$$(d/dx)(\arctan e^x) = \text{??}$$

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

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

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

(d) none of the above



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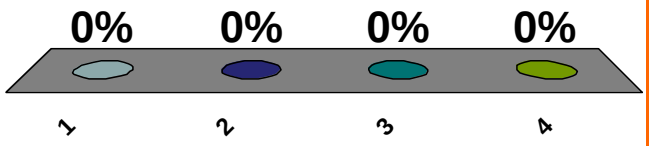
$$(d/dx)(e^{-2x})$$

(a) e^{-2x}

(b) e^{-2}

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

(d) none of the above



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

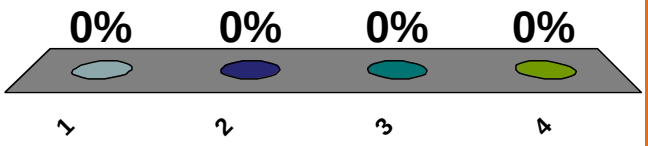
(a) e^{-2x}

(b) e^{-2}

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

(d) none of the above

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



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

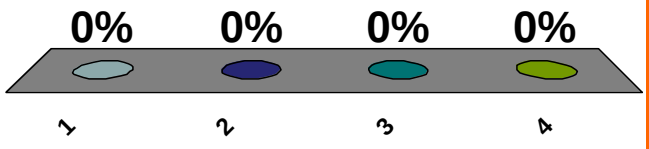
$$f(4) = 7,\ f'(4) = 1$$
$$g(7) = 6,\ g'(7) = 3$$
$$h(x) = g(f(x))$$
$$h(4) = ??,\ h'(4) = ??$$

(a) 42, 27

(b) 6, 3

(c) 6, 27

(d) none of the above



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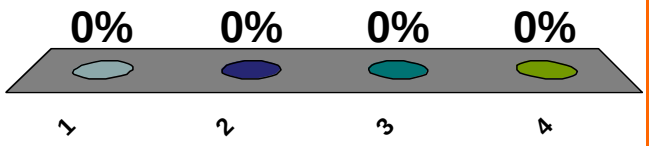
$$\frac{d}{dt}\left[\csc\theta\right]$$

(a) $-\left[\csc\theta\right]\left[\cot\theta\right]\left[\dot{\theta}\right]$

(b) $-\left[\csc\theta\right]\left[\cot\theta\right]$

(c) $-\left[\csc^2\theta\right]\left[\dot{\theta}\right]$

(d) none of the above



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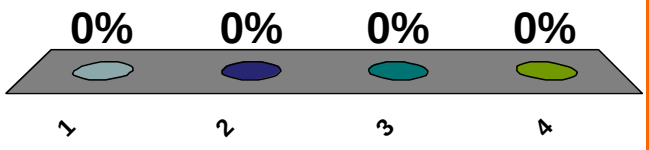
$(d/dx)(\ln x)$

(a) $1/x$

(b) $|1/x|$

(c) $1/x,\ x > 0$

(d) none of the above



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Topic 0390

0 pts

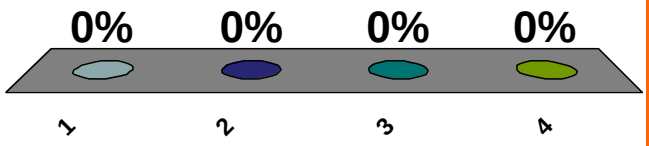
$(d/dx)(\ln|x|)$

(a) $1/x$

(b) $|1/x|$

(c) $1/x,\ x > 0$

(d) none of the above



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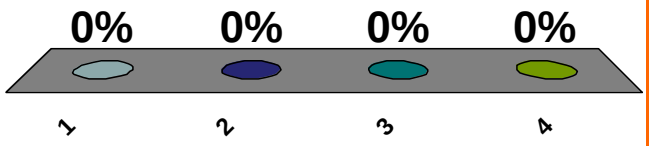
$$\frac{d}{dx}\left[\text{la}\left(x^2+4x-1\right)\right]$$

(a) $\text{la}\,(2x+4)$

(b) $\left[\text{la}\left(x^2+4x-1\right)\right][2x+4]$

(c) $\dfrac{2x+4}{x^2+4x-1}$

(d) none of the above



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Topic 0390

10 pts

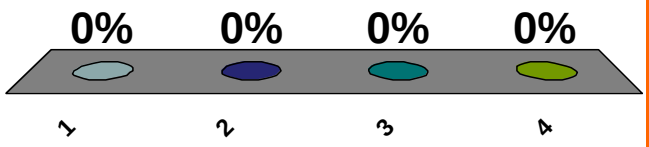
$$\frac{d}{dx}\left[\text{la}\left(\left(x^2+4x-1\right)^{1/3}\right)\right]$$

(a) $\dfrac{1}{3}\cdot\dfrac{2x+4}{x^2+4x-1}$

(b) $\left(\dfrac{2x+4}{x^2+4x-1}\right)^{1/3}$

(c) $\dfrac{1}{3}\left(\dfrac{2x+4}{x^2+4x-1}\right)^{-2/3}$

(d) none of the above



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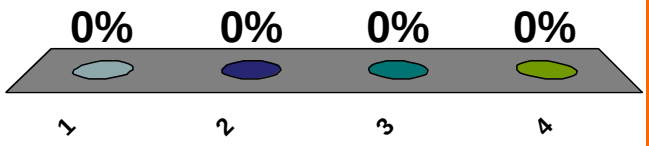
$$\frac{d}{dx}\left[\ln\left|x^2+3x-1\right|\right]$$

(a) $\ln|2x+3|$

(b) $\dfrac{2x+3}{x^2+3x-1}$

(c) $\dfrac{x^2+3x-1}{2x+3}$

(d) none of the above



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Principle of log diff:

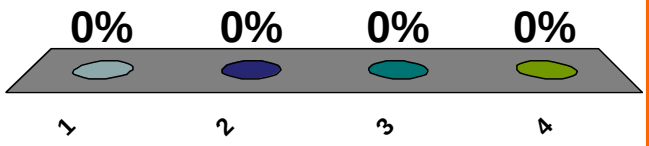
$$f'(x) = \text{??}$$

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

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

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

(d) none of the above



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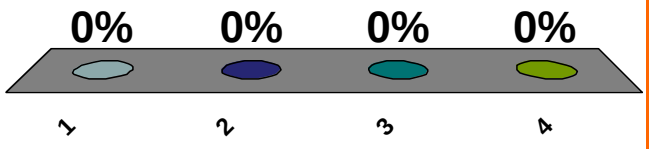
(a) $x(1+x^2)^{x-1}\left[\frac{d}{dx}(1+x^2)\right]$

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

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

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

(d) none of the above



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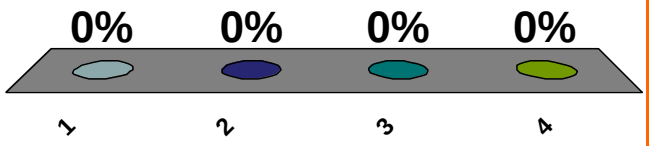
logarithmic derivative w.r.t. x of
$-x^4 + 5x^2 + 2$

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

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

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

(d) none of the above



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

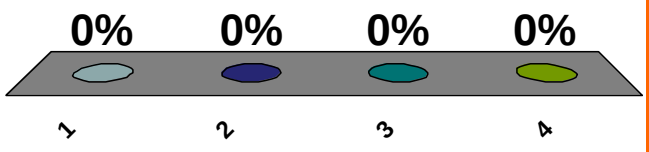
i.e., solve $10^{??} = 7$.

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

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

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

(d) none of the above



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

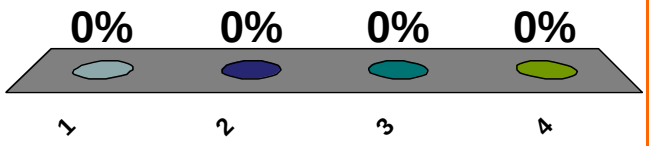
i.e., solve $10^{??} = x$.

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

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

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

(d) none of the above



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

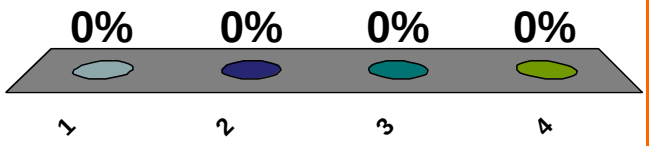
$$\frac{d}{dx}\left[\log_{10}(x)\right] \underset{x>0}{=} \text{??}$$

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

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

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

(d) none of the above



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

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

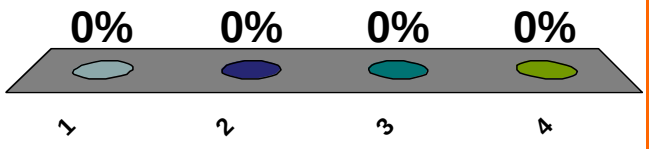
$$f'(x) = e^x + 5x^4$$

(a) $e + 1$

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

(c) $e + 5$

(d) none of the above



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

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

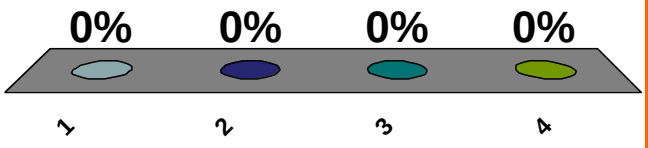
$$h'(4) = \frac{[g(4)][f'(4)] - [f(4)][g'(4)]}{[g(4)]^2}$$

(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



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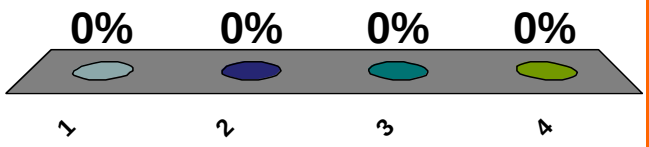
$$\frac{d}{dx}\left[\frac{\sin x}{x^2}\right] = ??$$

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

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

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

(d) none of the above



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Topic 0360

0 pts

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

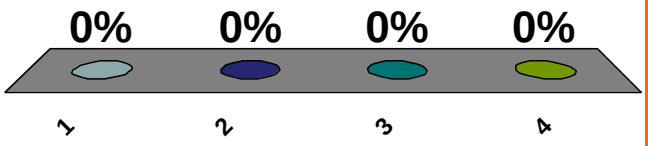
(a) $(1)(\cos x) + (0)(-\sin x)$

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

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

(d) none of the above

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



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$$f(x) = x^3, \quad f'(x) = 3x^2$$

eq'n of tan. line at $(2\ ,\ 8)$

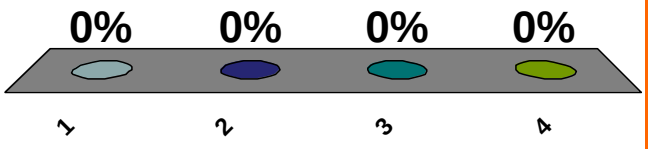
(a) $y - 2 = 3x^2(x - 8)$

(b) $y - 8 = 3x^2(x - 2)$

(c) $x - 8 = 3x^2(y - 2)$

(d) none of the above

Correct: $y - 8 = 12(x - 2)$



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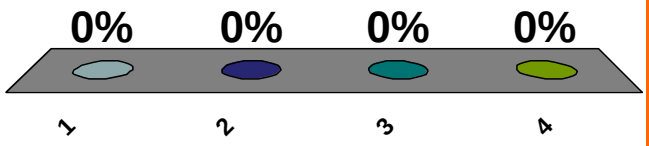
$$\lim_{x \to -\infty} \left[\frac{100x^4 + 2x - 1}{x + 1} \right] = ??$$

(a) $-\infty$

(b) ∞

(c) 100

(d) none of the above



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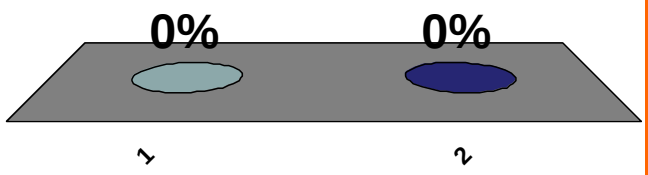
T or F:

$f' > 0$ on $(2, 3)$

$\Rightarrow$ f incr. on $(2, 3)$

(a) True

(b) False



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Topic 0290

10 pts

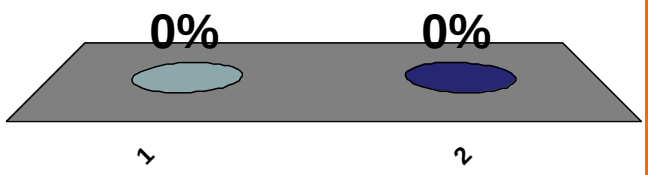
T or F:

f incr. on $(2,3)$

$\Rightarrow$ $f' > 0$ on $(2,3)$

(a) True

(b) False



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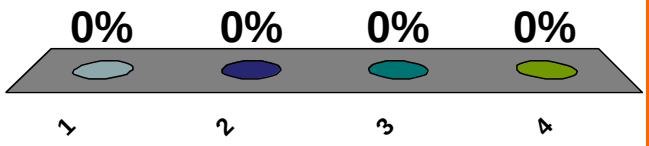
$$\frac{d}{dx}\left[(\ln 8)(\sin 3)\right] = ??$$

(a) 0

(b) $(1/8)(\sin 3) + (\ln 8)(\cos 3)$

(c) $(1/8)(\cos 3)$

(d) none of the above



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

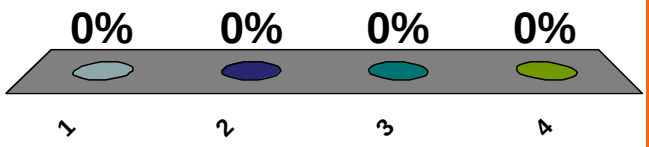
(a) DNE

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

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

(d) none of the above

Correct answer: 0



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

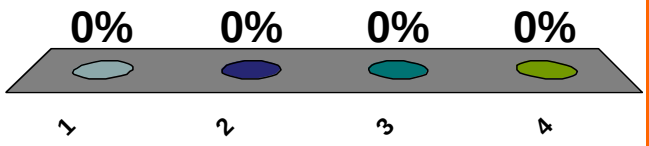
$$\frac{d}{dx}\left[x^{1/2}\right] = ??$$

(a) DNE

(b) [1/2] $\left[x^{-1/2}\right]$

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

(d) none of the above



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

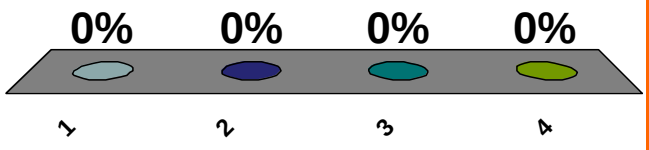
$$\frac{d}{dx}\left[(\ln 5)x\right] = ??$$

(a) $x/5$

(b) $\ln 5$

(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

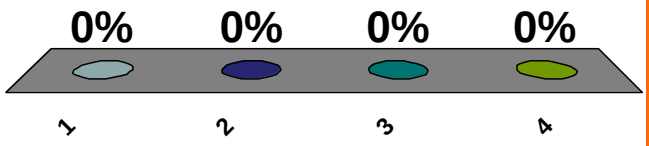
$$\frac{d}{dx}\left[e^{-2}x\right] = ??$$

(a) e^{-2}

(b) $-2e^{-3}x$

(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

SAVE THE SESSION DATA

RETURN TO PRESENTATION

additivity of error
homogeneous vs. inhomogeneous
homog. linear polynomial in x, y, z

LOOK AHEAD

d/dt and d/ds
differentiation
differentiation w.r.t. x of expr. with y
log diff