

Calculus

W 8 February 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

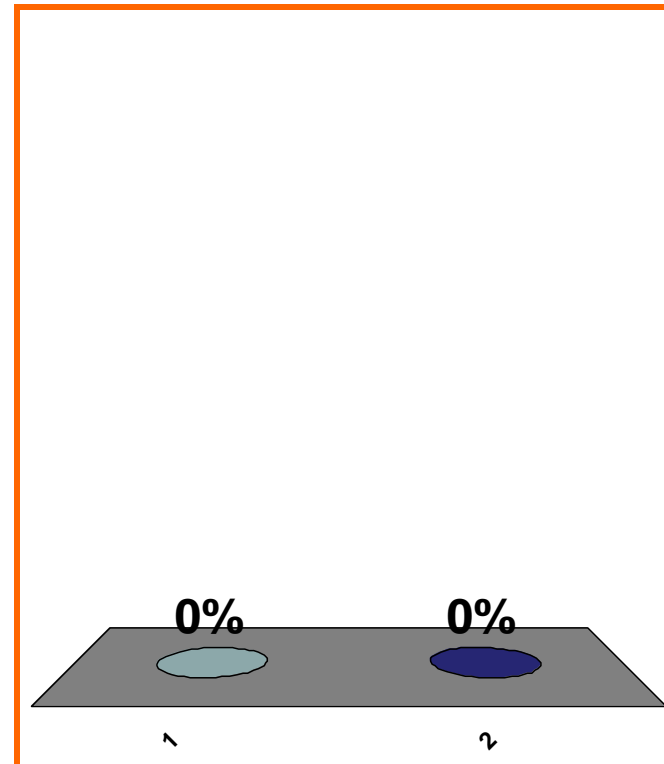
T or F:

$f' > 0$ on $(2, 3)$
 f 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
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

0 of 5

Topic 0290

10 pts

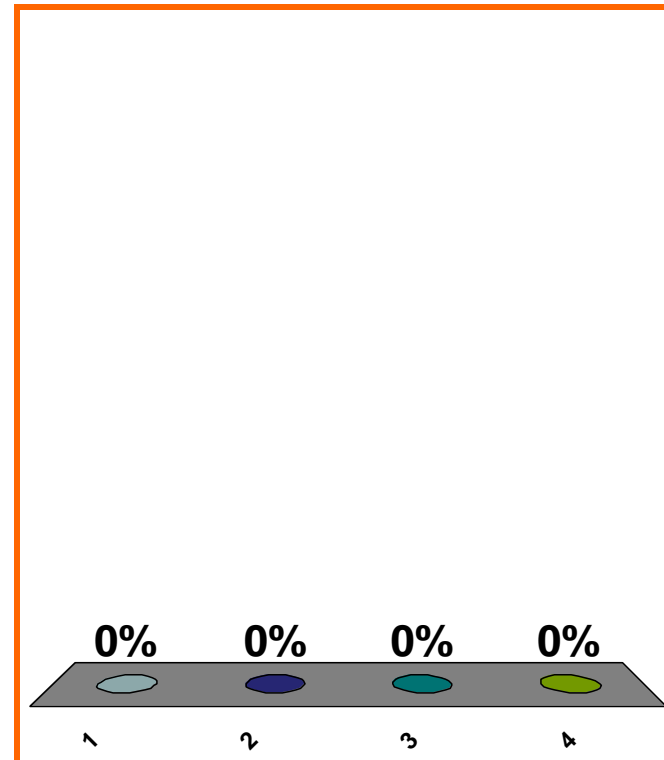
line's slope = 8
goes through (2, 7)
equation?

(a) $x = 7 + 8(y - 2)$

(b) $y = 8 + 7(x - 2)$

(c) $y = 7 + 8(x - 2)$

(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

tangent line to $y = f(x)$ at $(2, 7)$

$$y - 7 = 8(x - 2)$$

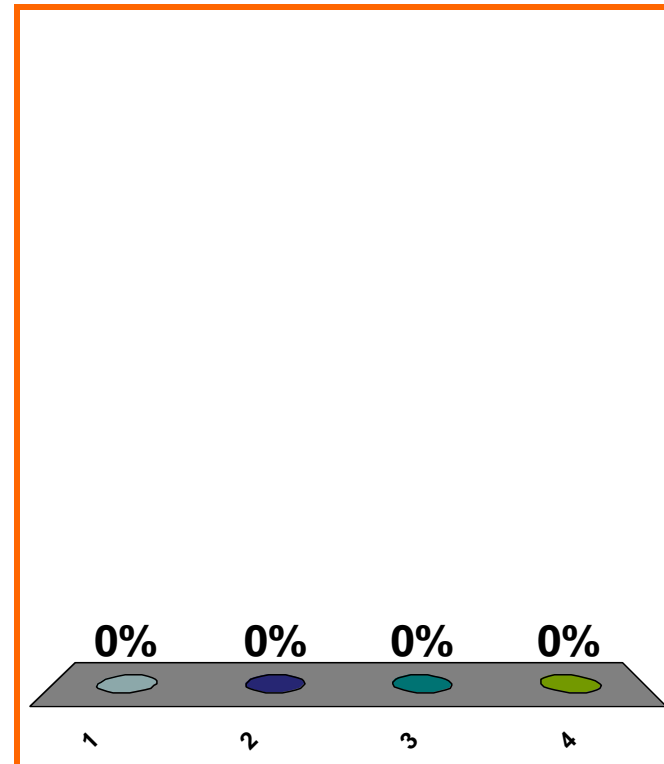
“linearization” of $f(x)$ at $x = 2$?

(a) $8(x - 2)$

(b) $7 + 8(x - 2)$

(c) $7 - 8(x - 2)$

(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

$$y = \sin x$$

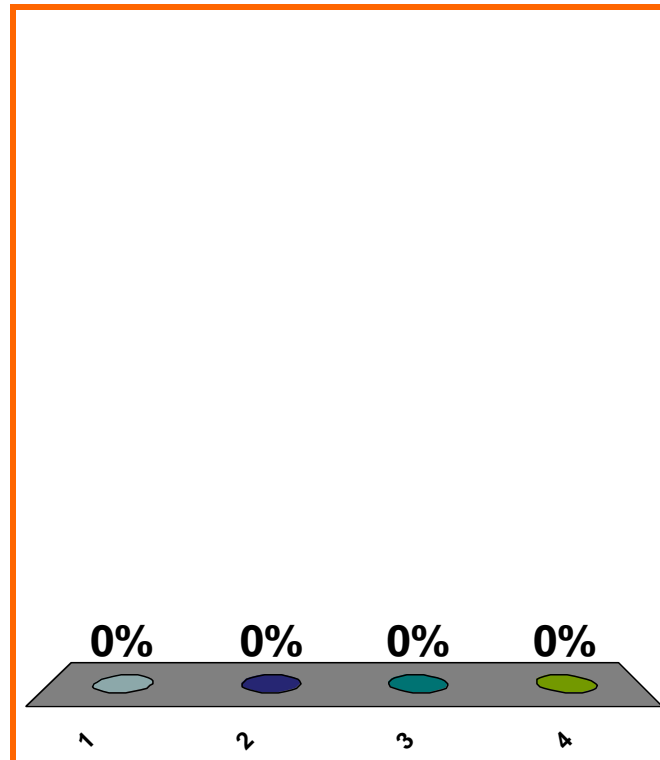
$$\Delta y = ??$$

(a) $[\sin(x + \Delta x)]$

(b) $[\sin(x + \Delta x)] - [\sin x]$

(c) $\frac{[\sin(x + \Delta x)] - [\sin x]}{\Delta x}$

(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

$$P(x) = (x - 3)^5(x^2 + x + 4)$$

$$Q(x) = (x - 3)^8(5x^9 + 9x - 7)$$

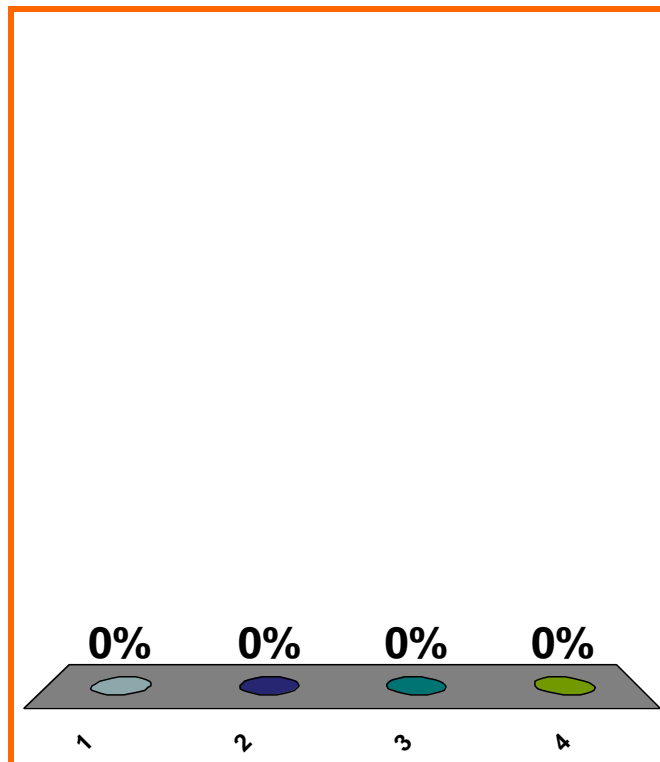
$$\lim_{x \rightarrow 3^-} \frac{P(x)}{Q(x)} = ??$$

(a) 0

(b) ∞

(c) $-\infty$

(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 0200

10 pts

9

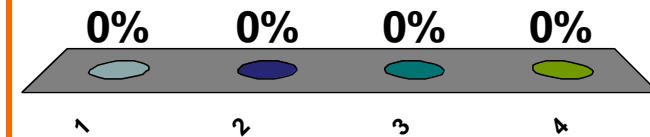
$$(a) x \approx 2 \Rightarrow f(x) \approx 7$$

$$\lim_{x \rightarrow 2} f(x) = 7$$

$$(b) x \approx 2, x \neq 2 \Rightarrow f(x) \approx 7, f(x) \neq 7$$

$$(c) x \approx 2, x \neq 2 \Rightarrow f(x) \approx 7$$

(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 0150

10 pts

10

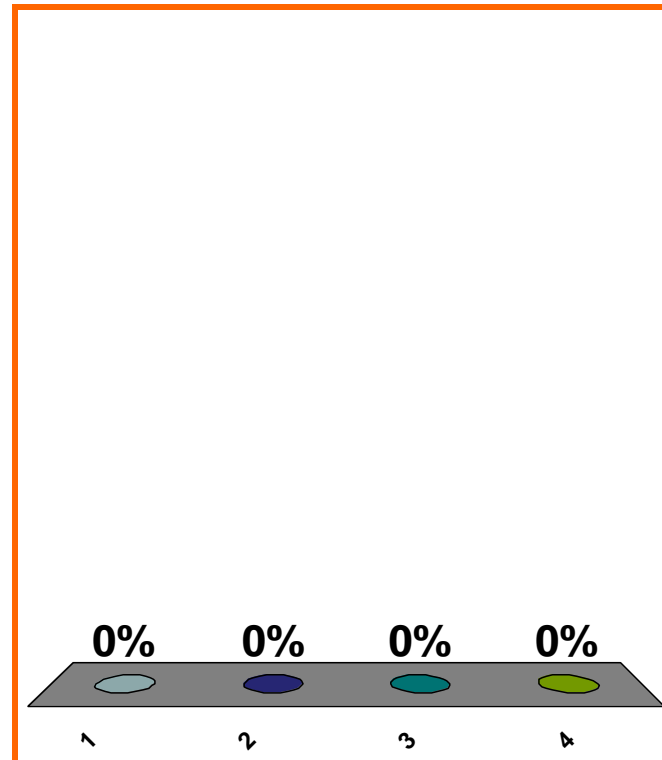
$$\lim_{x \rightarrow 0} \left[\frac{6x^8 + 7x^4 - 8x^3}{7x^5 - 2x^4 + 9x^3} \right] = ??$$

(a) DNE

(b) $-8/9$

(c) $6/7$

(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 0240

10 pts

11

$$\lim_{x \rightarrow \infty} \left[\frac{6x^8 + 7x^4 - 8x^3}{7x^5 - 2x^4 + 9x^3} \right] = ??$$

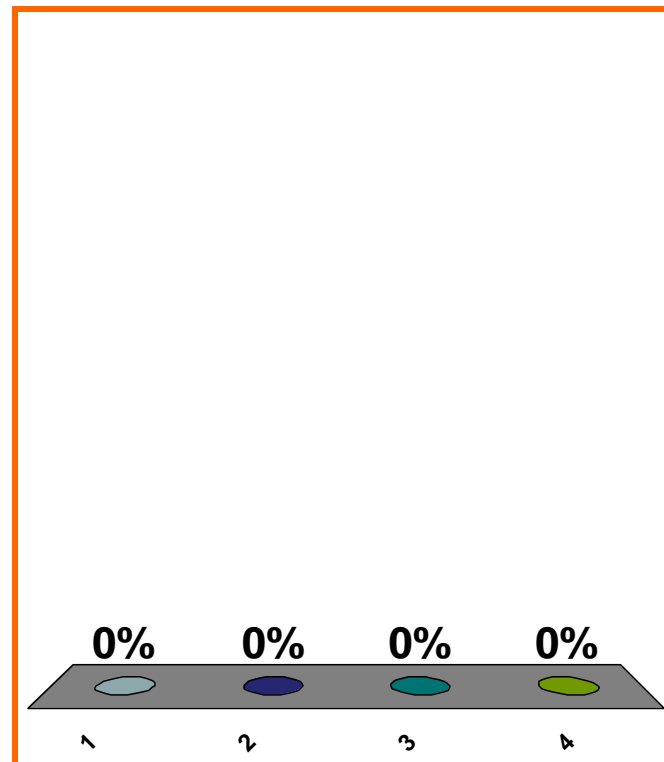
(a) DNE

(b) $-8/9$

(c) $6/7$

(d) none of the above

Correct answer: ∞



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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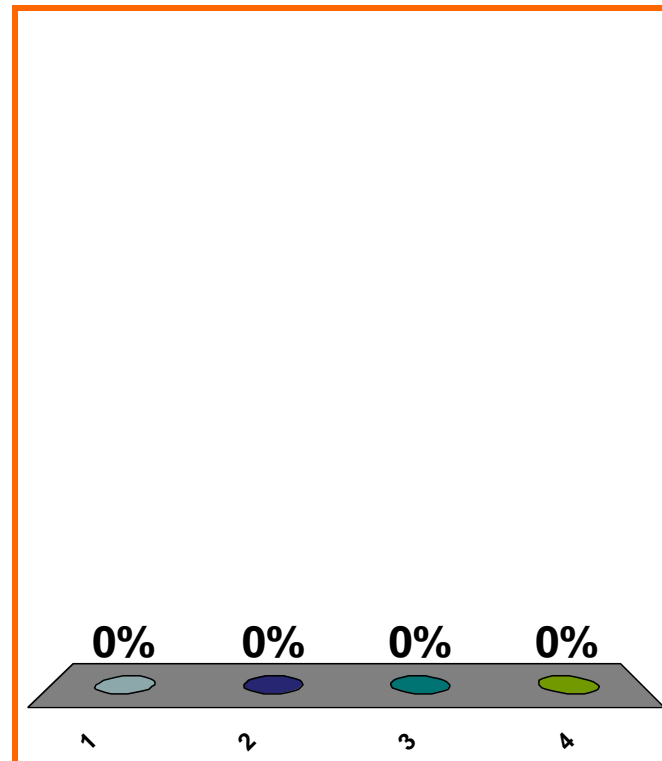
$$\lim_{x \rightarrow -\infty} \left[\frac{6x^8 + 7x^4 - 8x^3}{7x^5 - 2x^4 + 9x^3} \right] = ??$$

(a) 0

(b) ∞

(c) $-\infty$

(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

$$x - \sin x \underset{x \rightarrow 0}{\sim} x^3/6$$

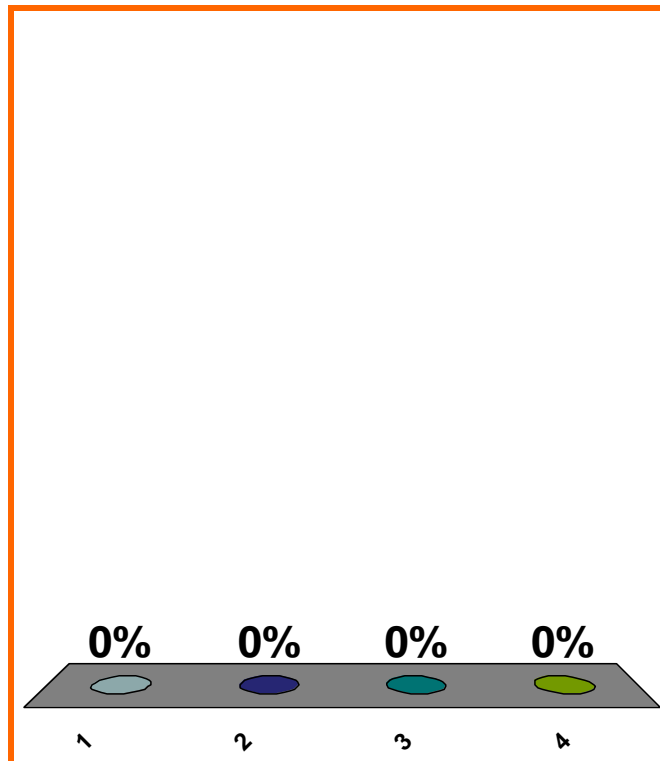
$$\lim_{x \rightarrow 0} \left[\frac{x^3 + x^4}{x - \sin x} \right] = ??$$

(a) DNE

(b) 6

(c) 1/6

(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 0140

10 pts

14

$$\sqrt{x^2 + 1} \sim ??$$

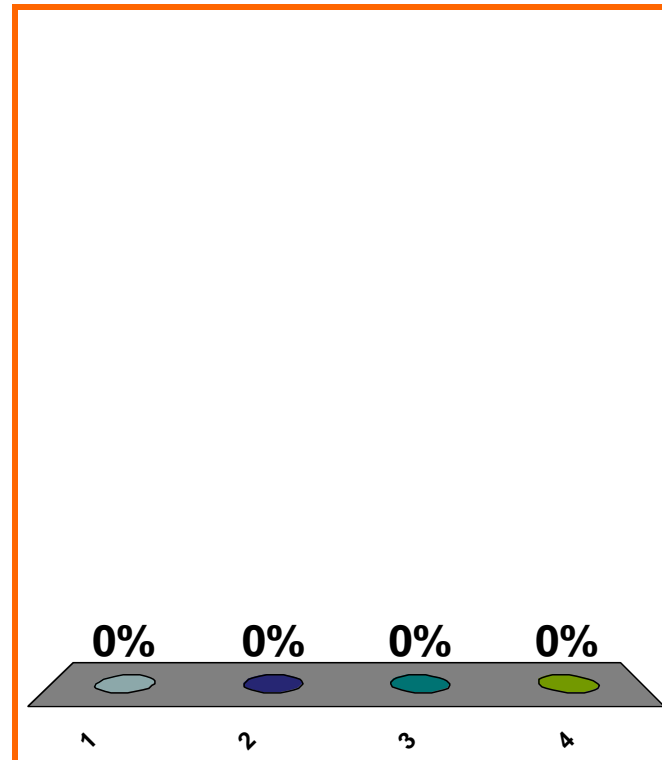
$x \rightarrow \infty$

(a) 1

(b) x

(c) $-x$

(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 0240

0 pts

15

$$\sqrt{x^2 + 1} \sim \text{??}$$

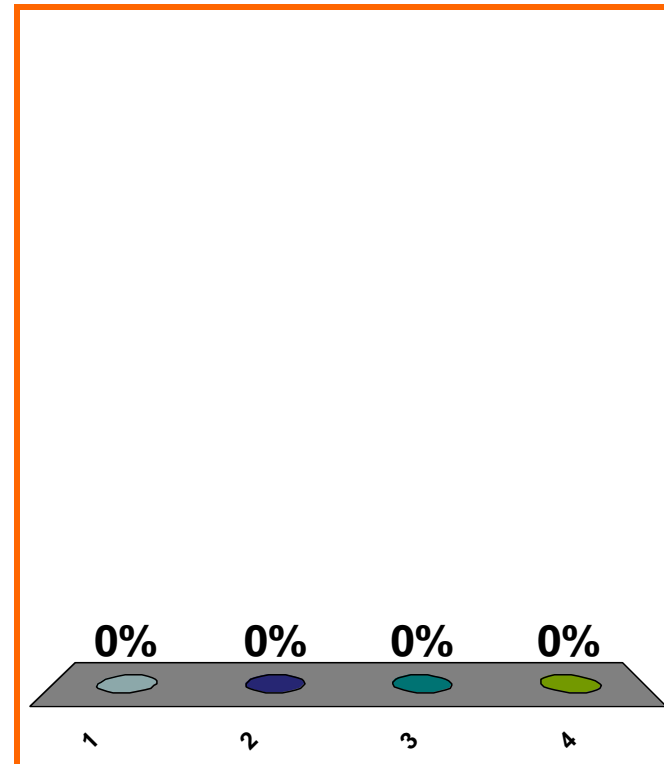
$x \rightarrow -\infty$

(a) 1

(b) x

(c) $-x$

(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

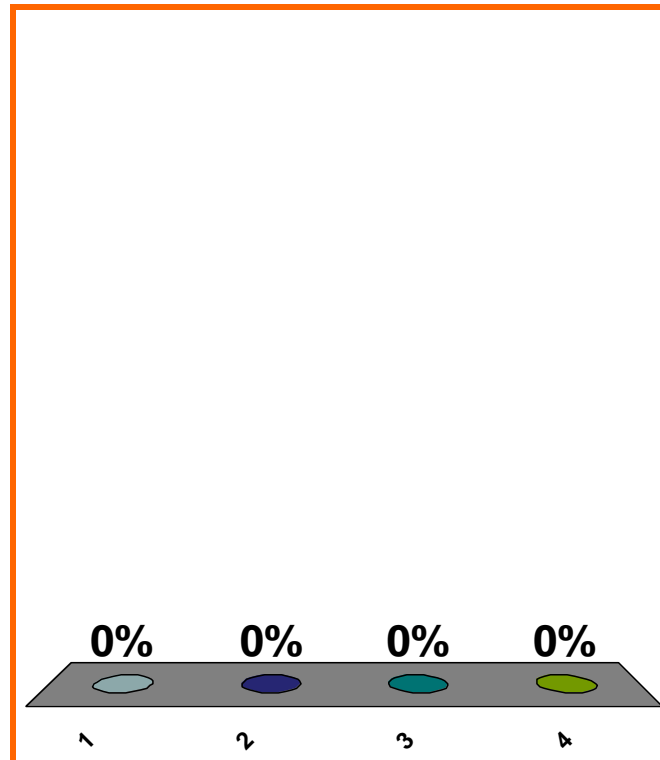
$$\lim_{x \rightarrow \infty} \left[\frac{\sqrt{x^2 + 1}}{3x} \right] = ??$$

(a) DNE

(b) 1/3

(c) -1/3

(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
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 0240

10 pts

17

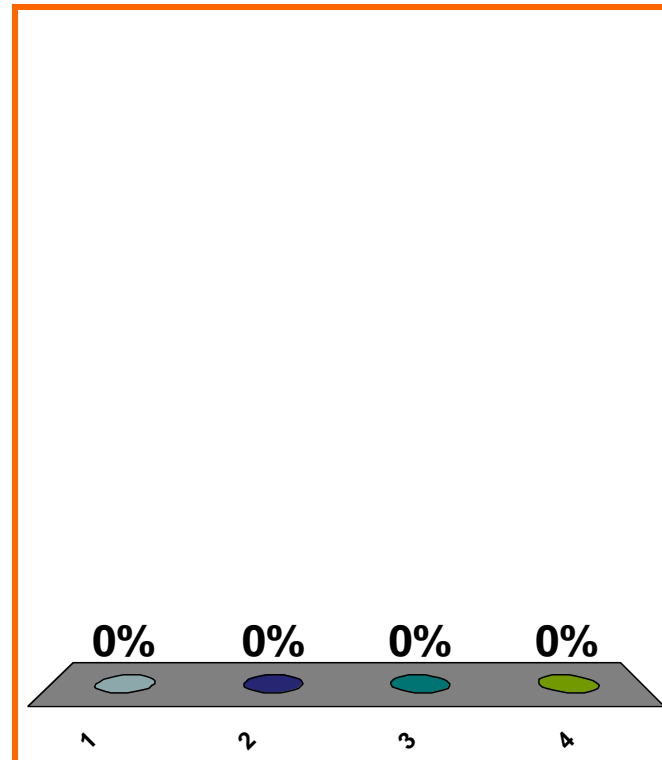
$$\lim_{x \rightarrow -\infty} \left[\frac{\sqrt{x^2 + 1}}{3x} \right] = ??$$

(a) DNE

(b) $1/3$

(c) $-1/3$

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

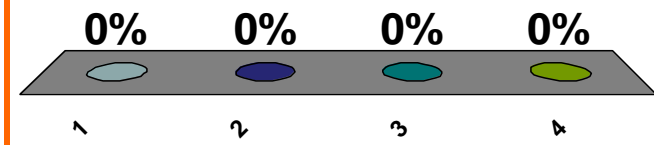
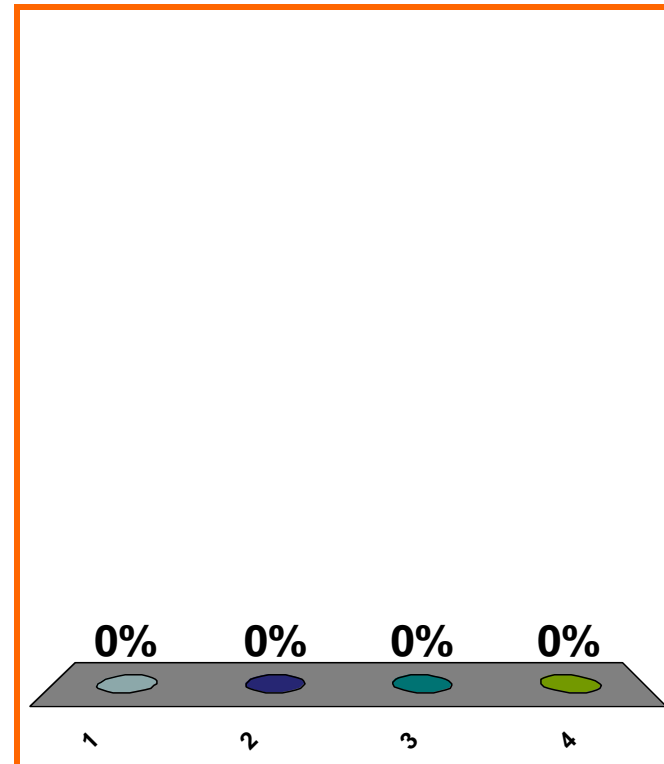
$$\ln(1 + (3/n)) \quad n \rightarrow \infty \quad ??$$

(a) $1/n^2$

(b) 1

(c) $3/n$

(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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LOOK AHEAD
Topic 0420

0 pts

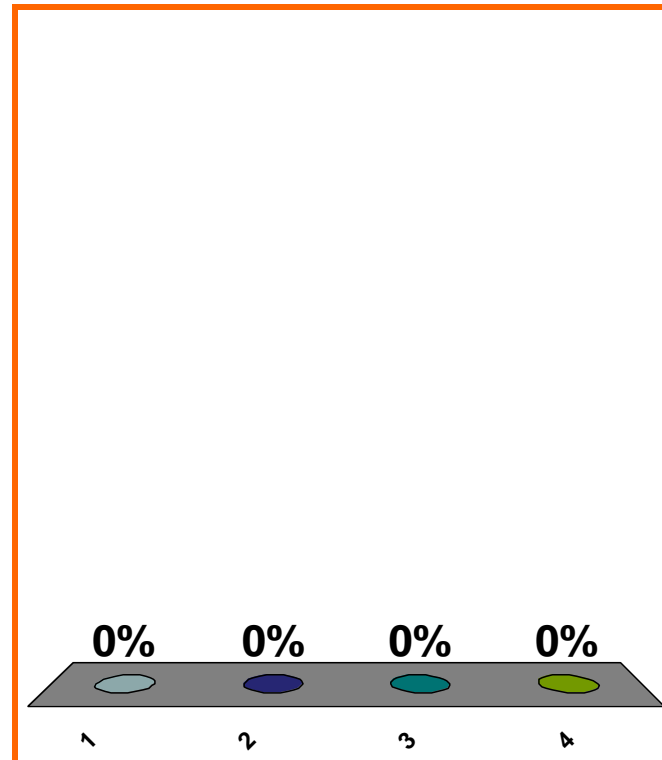
$$\ln(1 + 5x) \quad x \sim 0 \quad ??$$

(a) $4x^2$

(b) $5x$

(c) 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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LOOK AHEAD
Topic 0420

0 pts

20

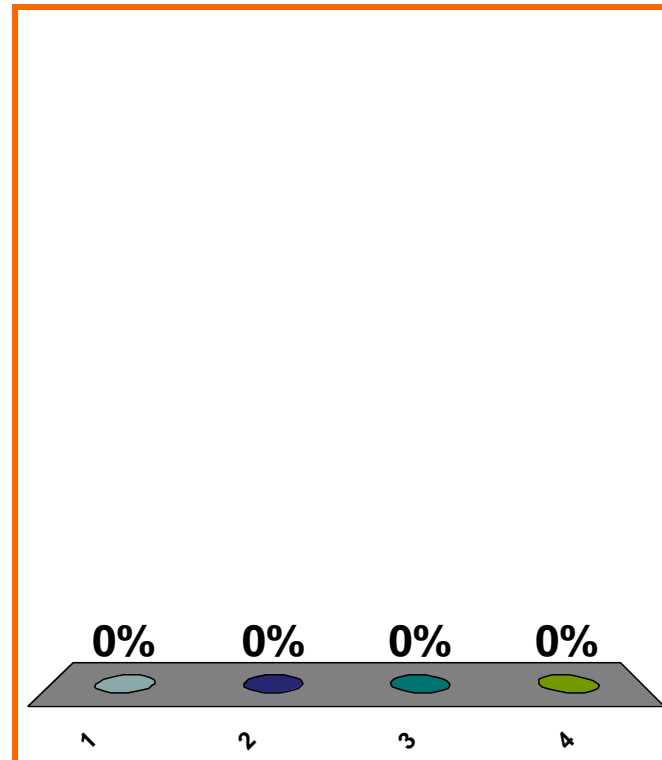
$$\ln(1 + 5x + 4x^2) \quad x \xrightarrow{\sim} 0 \quad ??$$

(a) $4x^2$

(b) $5x$

(c) 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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LOOK AHEAD
Topic 0420

0 pts

21

LOOK AHEAD

$(d/dt)(\text{expr of } u, v)$, *etc.*

deriv. of inv. trig fn

From graph of f to domain of f'

especially: from graph of \ln to domain of \ln'

especially: from graph of $x^{3/2}$ to domain
of its derivative

logarithmic derivatives

$$\lim_{h \rightarrow 0} \frac{|h|}{h}$$

$(d/dx)(x^2)$ from the def'n $\lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x}$

intervals of increase/decrease

intervals of concave up/concave down

graph derivative from graph of function

asymptotics: polynomial

asymptotics: $\sin x$, $\ln(1 + \dots)$

asymptotics: $+$, $-$, \times , \div , $(\bullet)^n$

LOOK AHEAD

$(d/dt)(\text{expr of } u)$, *etc.*

logarithmic derivatives

$(d/dt)(10^t)$

$(d/dt)(\log_{10}(t))$

summary: power rule, trig diff, \ln' , \exp'

summary: prod rule, quot rule, chain rule

$$f(1) = 200$$
$$f(3) = 800$$

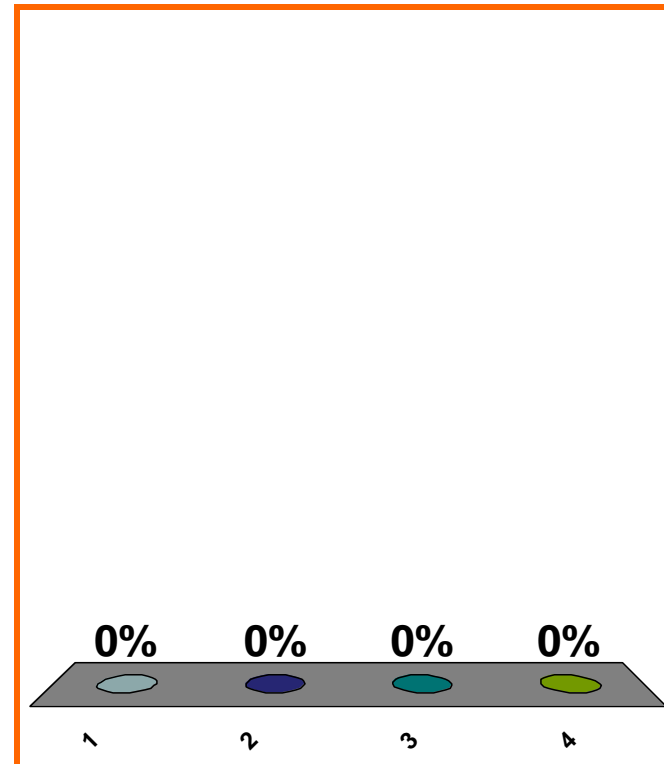
avg rate of change?

(a) $(800 - 200)/(3 - 1)$

(b) $(3 - 1)/(800 - 200)$

(c) $(200 - 800)/(3 - 1)$

(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

$$f(1) = 200$$

$$f(3) = 800$$

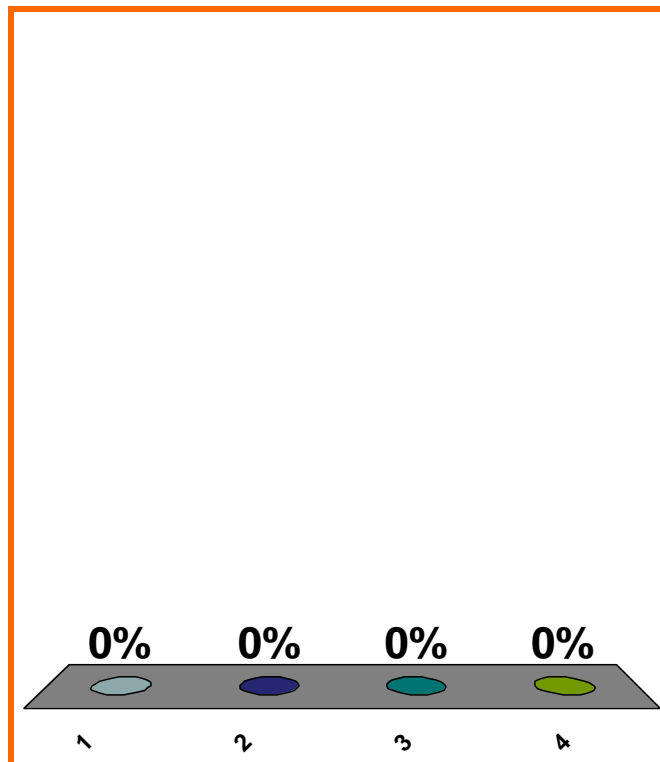
avg rate of change?

(a) $(200 - 800)/(1 - 3)$

(b) $(1 - 3)/(200 - 800)$

(c) $(800 - 200)/(1 - 3)$

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

$$f(x) = x^6/6, \quad f'(x) = x^5$$

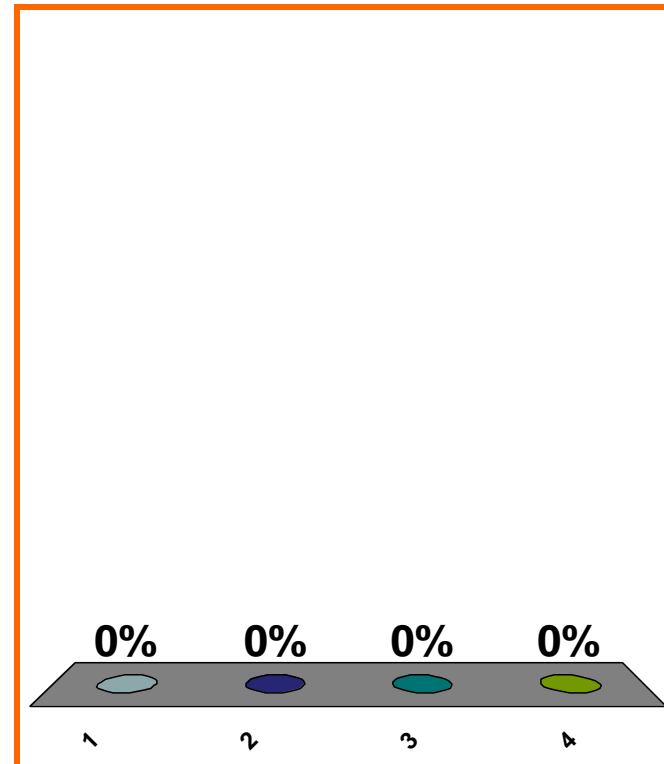
slope of tan. line at
(2, 2⁶/6)

(a) 2⁶/6

(b) (2⁶/6)⁵

(c) 2⁵

(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

$$\lim_{x \rightarrow \infty} \left[\frac{100x^3 + 2x - 1}{x^4 - x^3 + x^2 + 1} \right] = ??$$

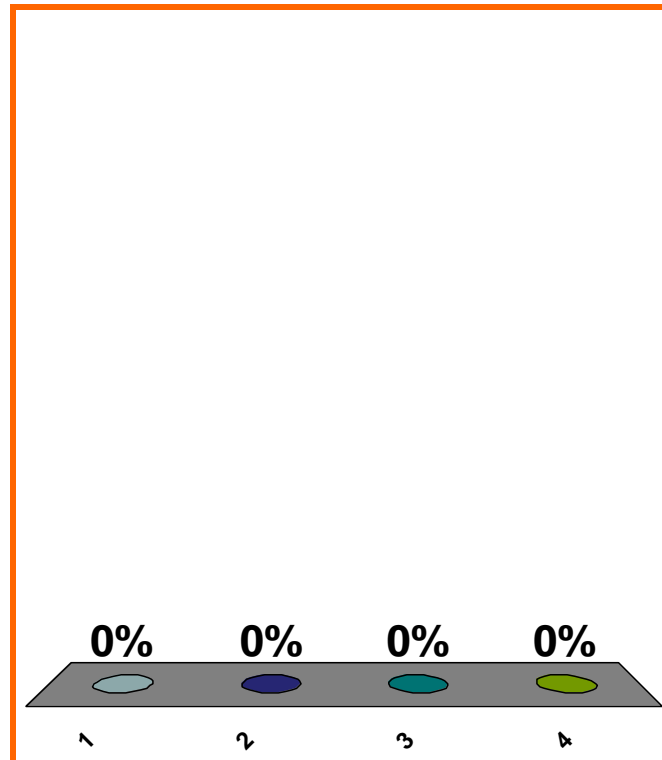
(a) ∞

(b) $-\infty$

(c) 100

(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

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Topic 0250

0 pts

27

$$\lim_{x \rightarrow -\infty} \left[\frac{100x^3 + 2x - 1}{x^4 - x^3 + x^2 + 1} \right] = ??$$

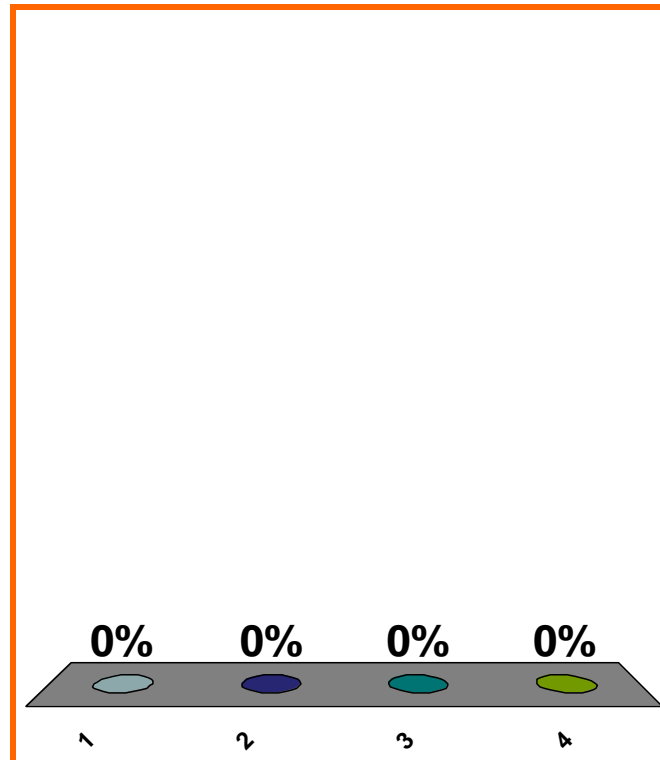
(a) ∞

(b) $-\infty$

(c) 100

(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

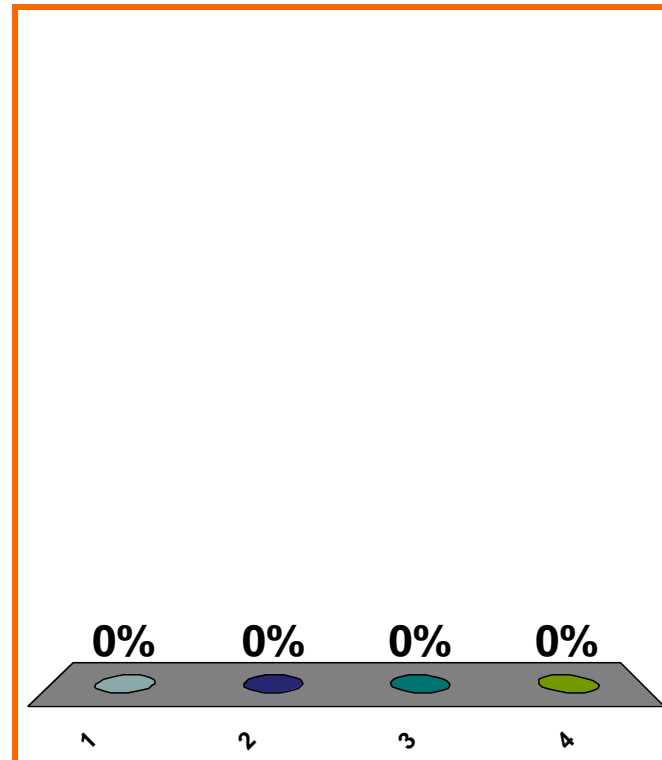
$$\lim_{x \rightarrow -\infty} \left[\frac{100x^3 + 2x - 1}{x^3 + x^2 + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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

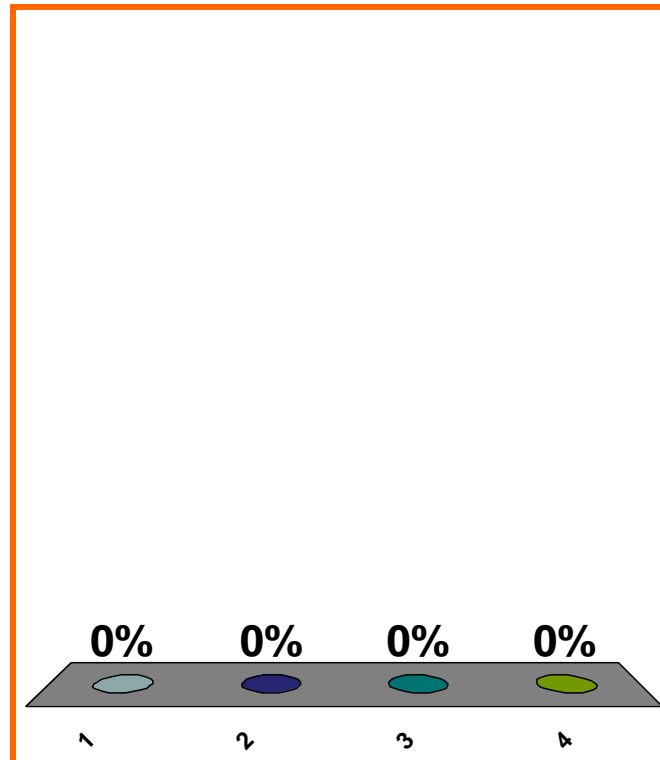
$$\lim_{x \rightarrow \infty} \left[\frac{100x^3 + 2x - 1}{x^3 + x^2 + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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

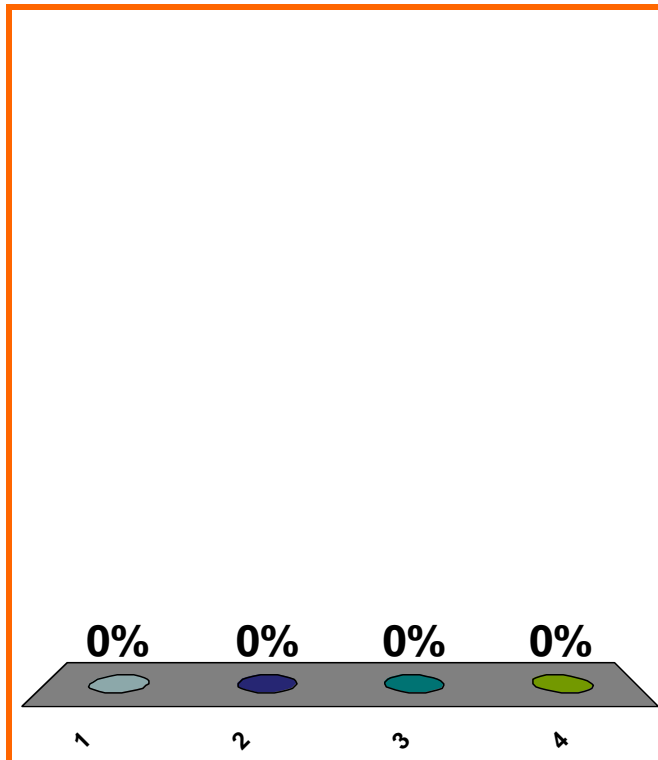
$$\lim_{x \rightarrow \infty} \left[\frac{100x^3 + 2x - 1}{x^2 + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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

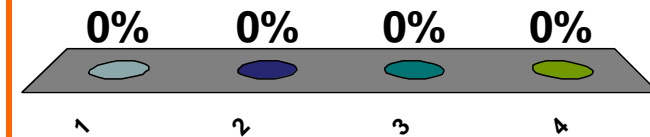
$$\lim_{x \rightarrow -\infty} \left[\frac{100x^3 + 2x - 1}{x^2 + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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 0250

0 pts

32

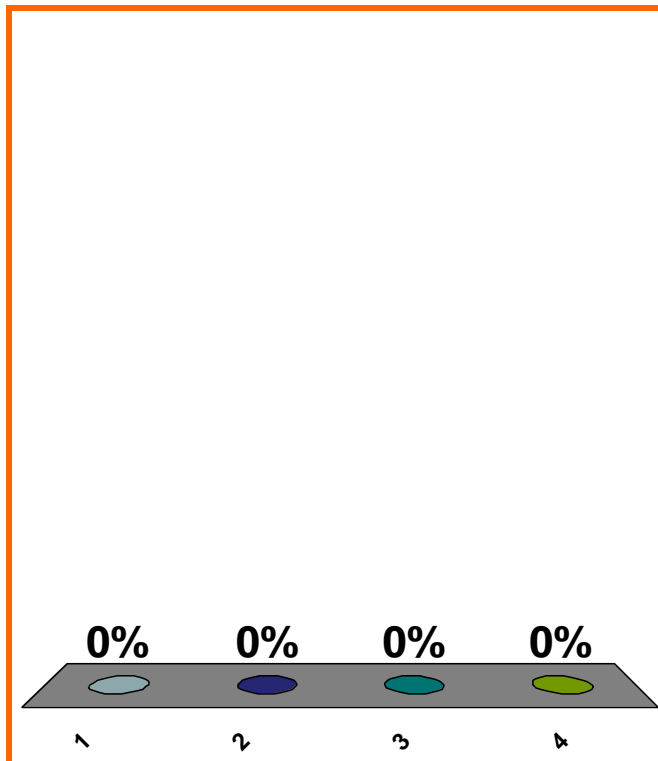
$$\lim_{x \rightarrow -\infty} \left[\frac{100x^3 + 2x - 1}{x + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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

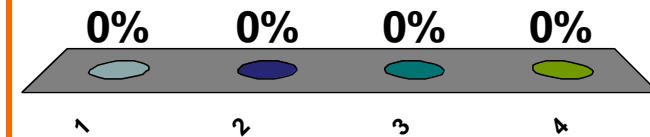
$$\lim_{x \rightarrow \infty} \left[\frac{100x^3 + 2x - 1}{x + 1} \right] = ??$$

(a) ∞

(b) $-\infty$

(c) 100

(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 0250

0 pts

34

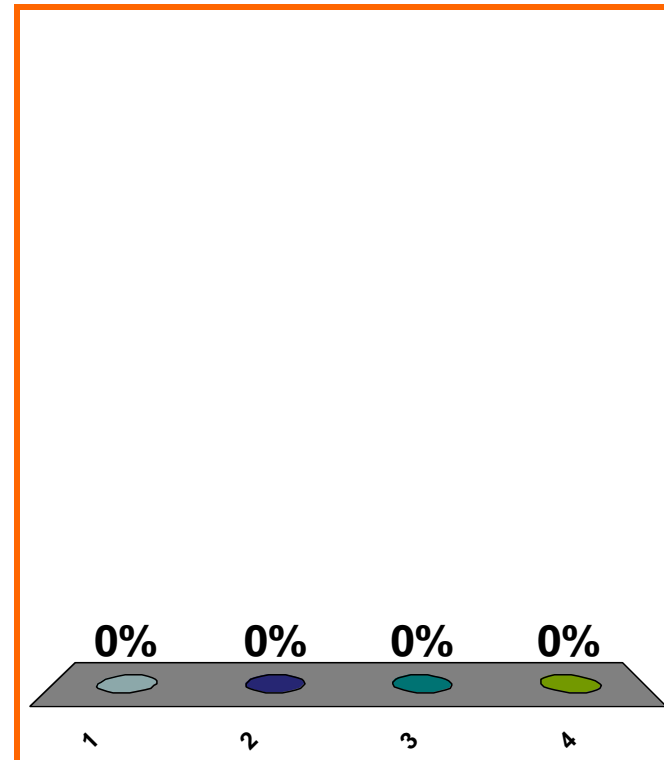
To get graph of $y + 1 = x^3$,
move graph of $y = x^3$...

(a) right 1

(b) left 1

(c) down 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

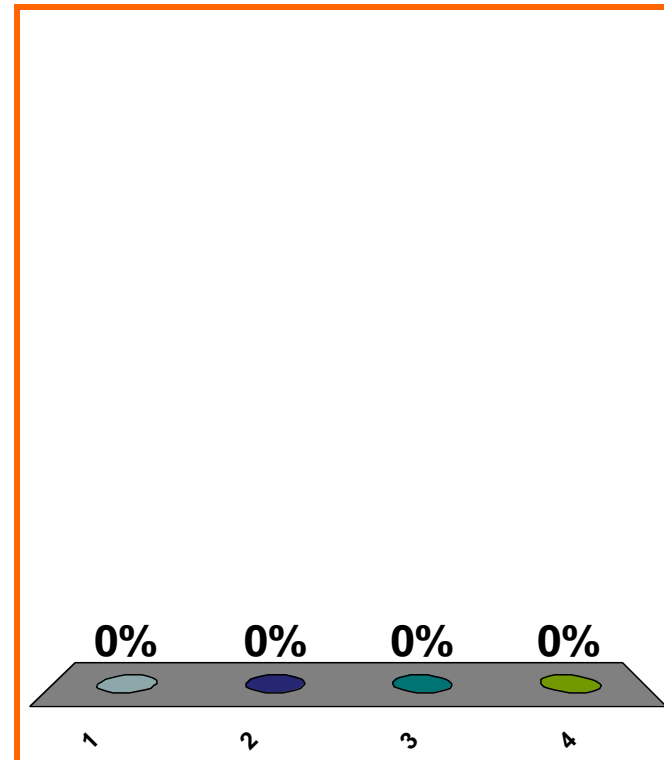
To get graph of $y^2 = \sin(x + \pi)$,
move graph of $y^2 = \sin(x)$...

(a) right π

(b) left π

(c) down π

(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

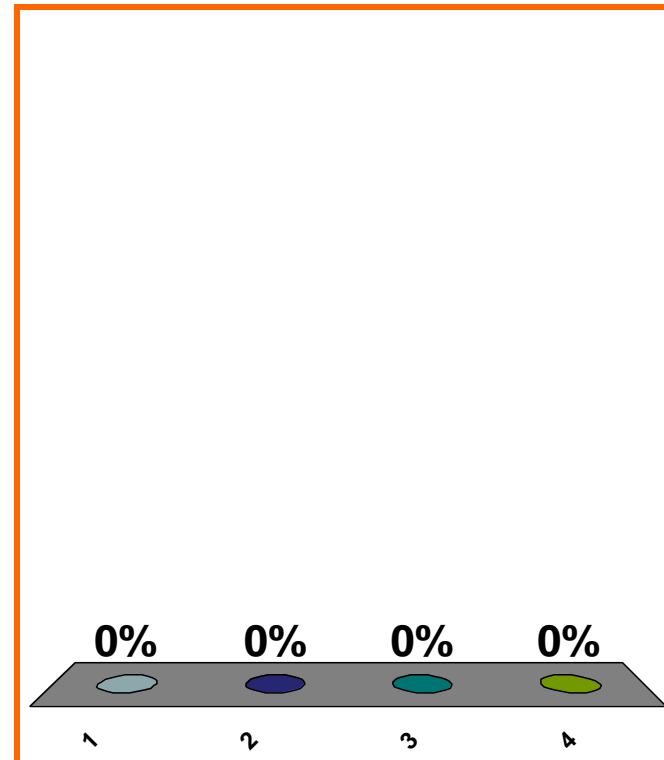
To get graph of $y^2 = \sin(x - \pi)$,
move graph of $y^2 = \sin(x)$...

(a) right π

(b) left π

(c) down π

(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

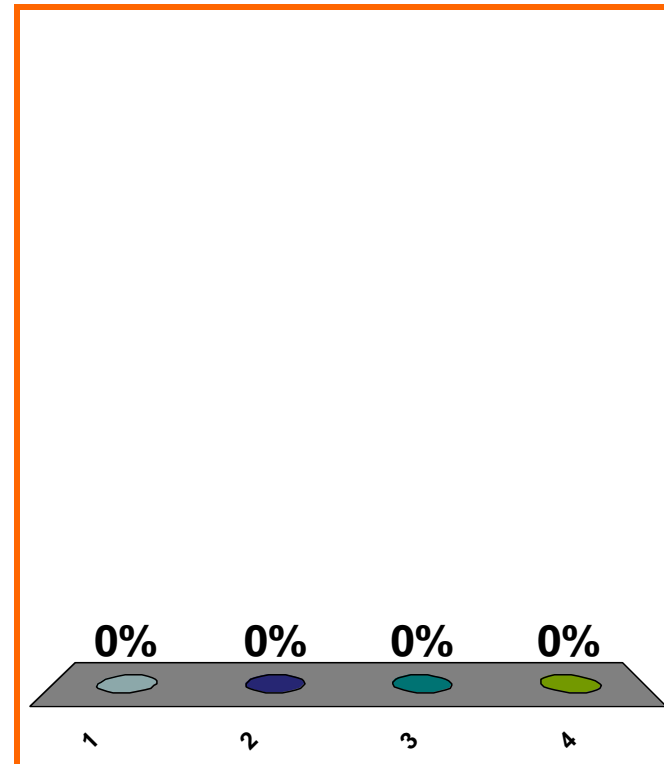
To get graph of $(y + \pi)^2 = \sin(x)$,
move graph of $y^2 = \sin(x)$...

(a) right π

(b) left π

(c) down π

(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

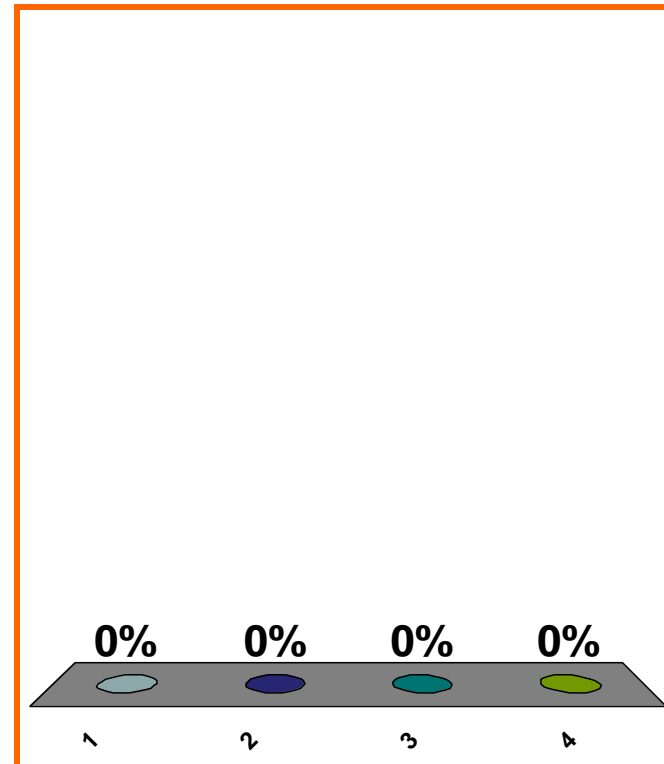
$$\sin(\pi/3) = ??$$

(a) $\sqrt{2}/2$

(b) $\sqrt{3}/2$

(c) $1/2$

(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

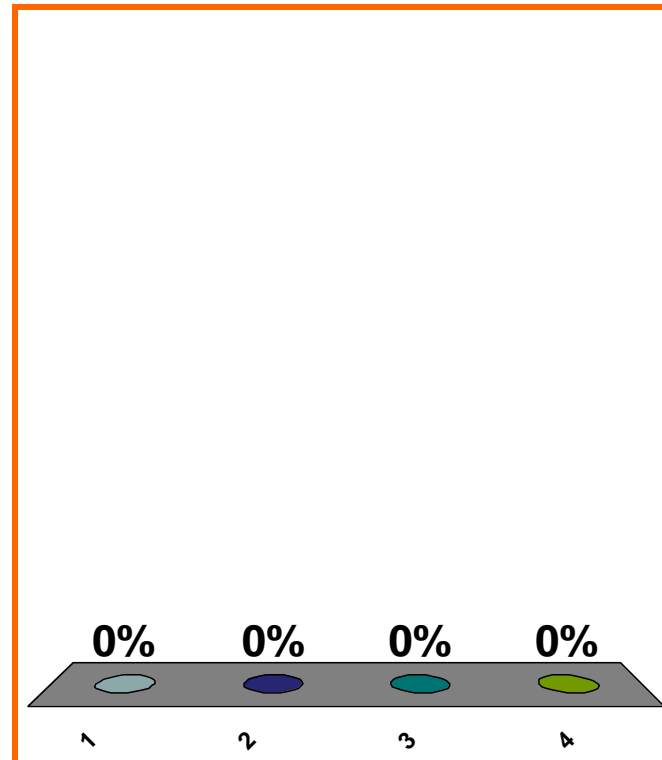
$$\arcsin(\sqrt{3}/2) = ??$$

(a) $\pi/3$

(b) $\pi/4$

(c) $\pi/6$

(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 0110

0 pts

40

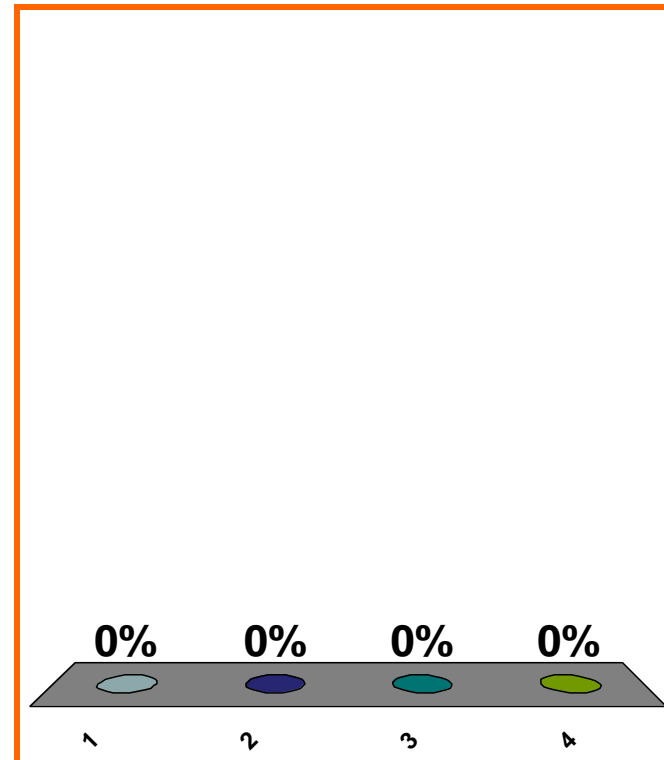
$$\sin(3\pi/4) = ??$$

(a) $\sqrt{2}/2$

(b) $-\sqrt{2}/2$

(c) $1/2$

(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

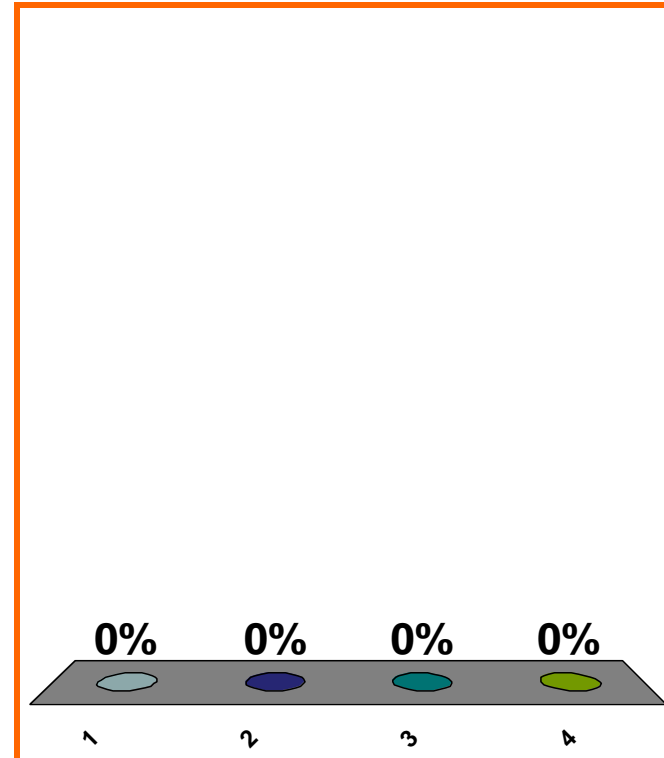
$$\arcsin(\sqrt{2}/2) = ??$$

(a) $\pi/3$

(b) $\pi/4$

(c) $\pi/6$

(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 0110

0 pts

42

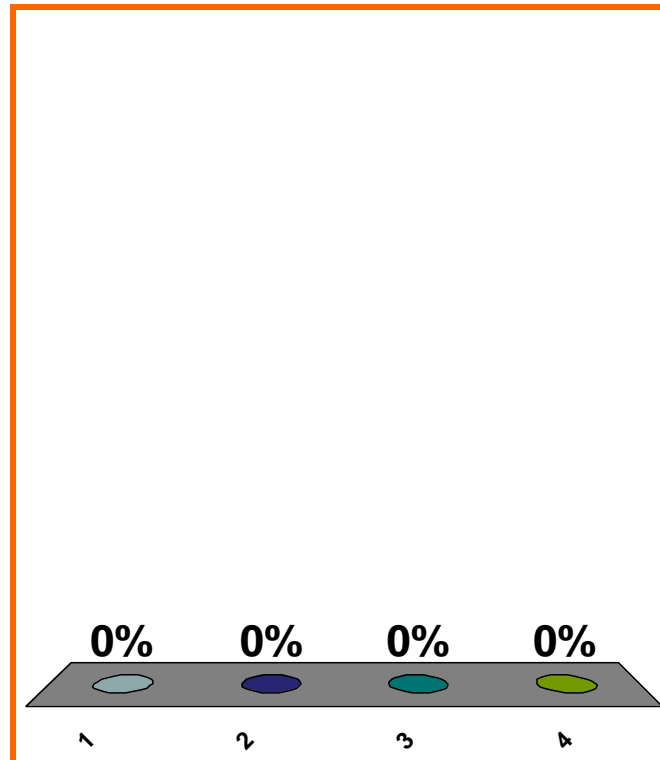
$$\frac{d}{dx} [(x^2)(\sin x)] = ??$$

(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

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LOOK AHEAD
Topic 0340

0 pts

43

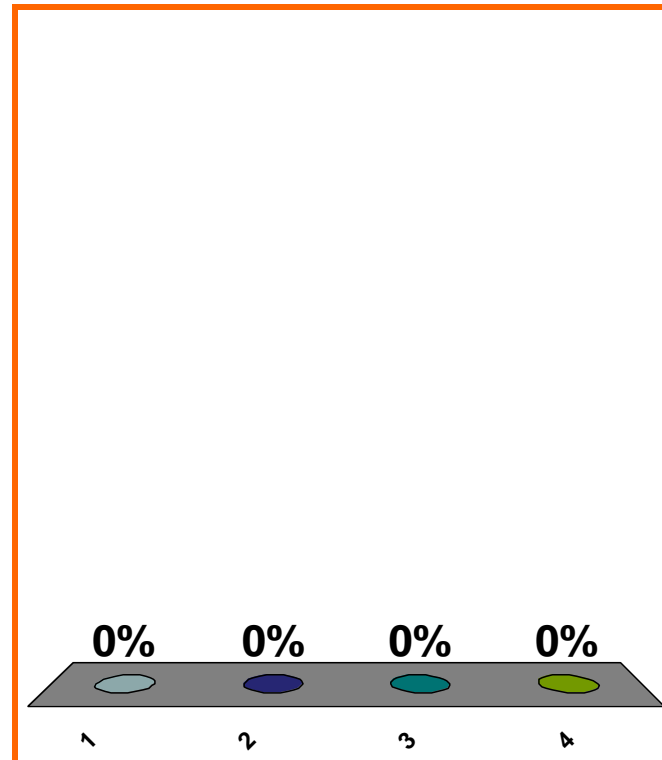
$$\frac{d}{dx} \left[\frac{\sin x}{x} \right] = ??$$

(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

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LOOK AHEAD
Topic 0350

0 pts

44

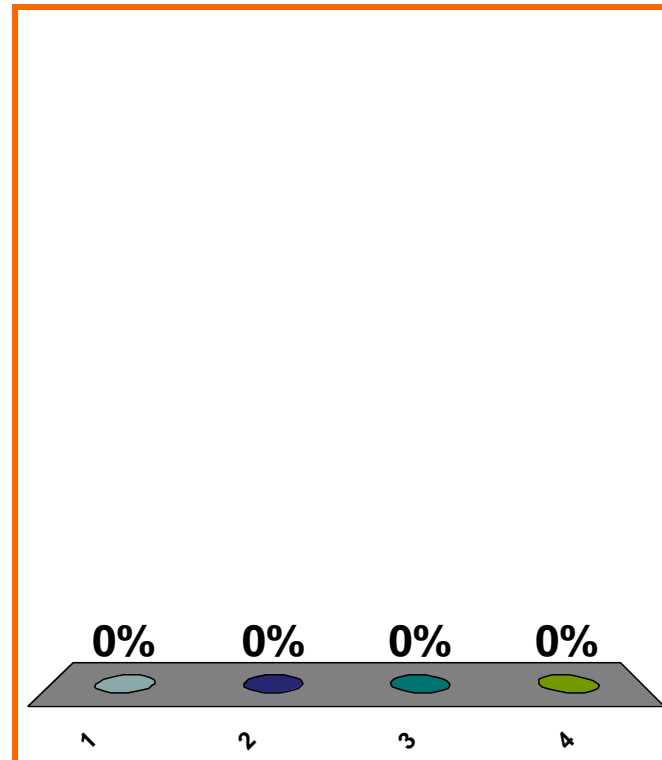
$$\lim_{x \rightarrow 5} (3x^3 - 2x + 8)$$

(a) $(3)(5^3) - (2)(5) + 8$

(b) $-\infty$

(c) ∞

(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

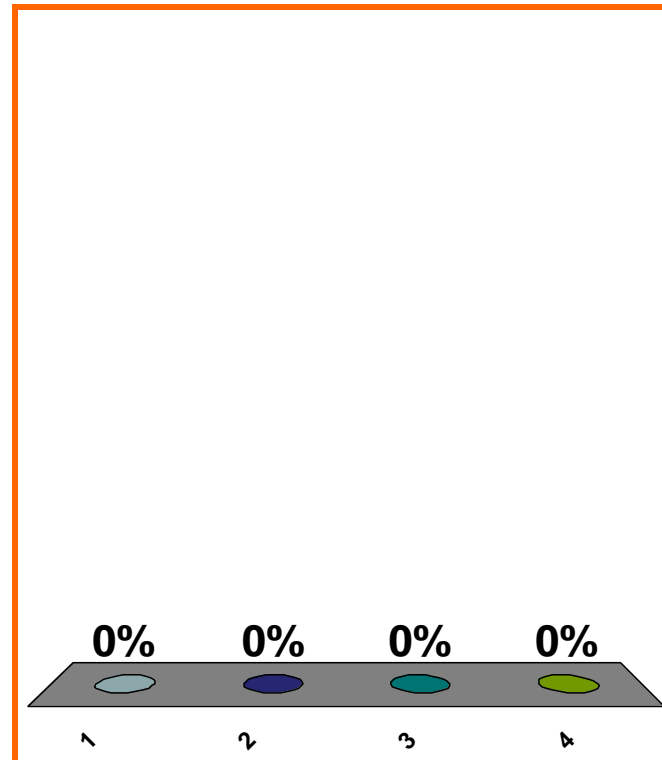
$$\lim_{x \rightarrow 5} \left(\frac{3x^3 - 2x + 8}{x - 4} \right)$$

(a) $(3)(5^3) - (2)(5) + 8$

(b) $-\infty$

(c) ∞

(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

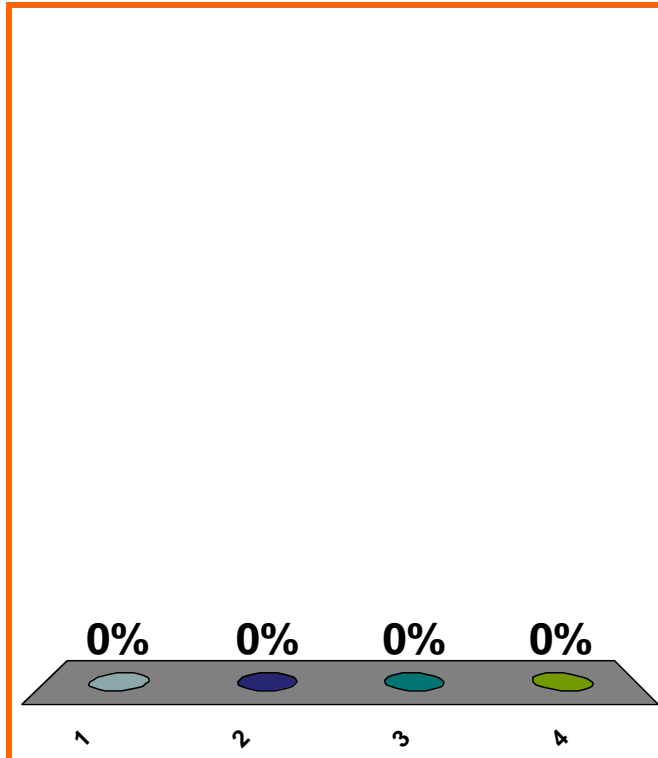
$$\lim_{x \rightarrow 5^+} \left(\frac{3x^3 - 2x + 8}{x - 5} \right)$$

(a) $(3)(5^3) - (2)(5) + 8$

(b) $-\infty$

(c) ∞

(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

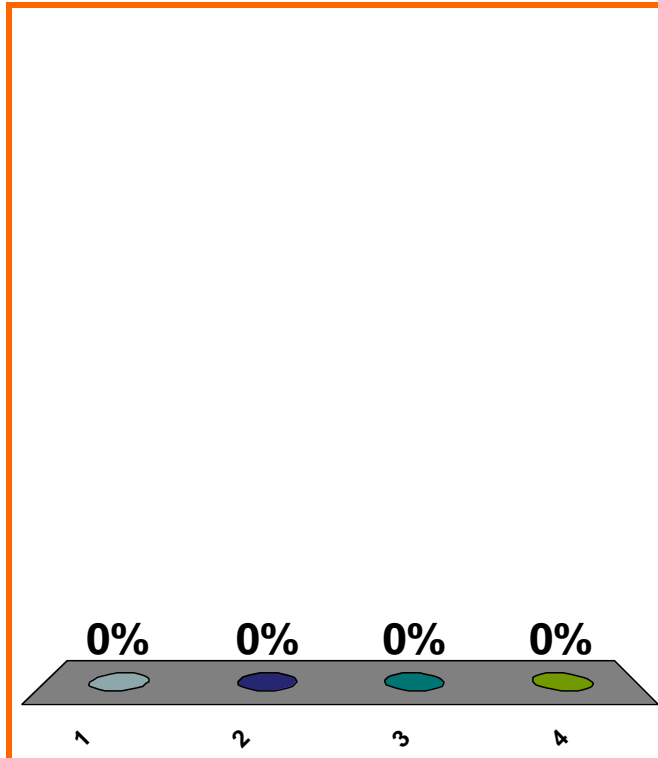
$$\lim_{x \rightarrow 5^-} \left(\frac{3x^3 - 2x + 8}{x - 5} \right)$$

(a) $(3)(5^3) - (2)(5) + 8$

(b) $-\infty$

(c) ∞

(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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LOOK AHEAD
Topic 0250

0 pts

48

$$\lim_{x \rightarrow 5} \left(\frac{3x^3 - 2x + 8}{x - 5} \right)$$

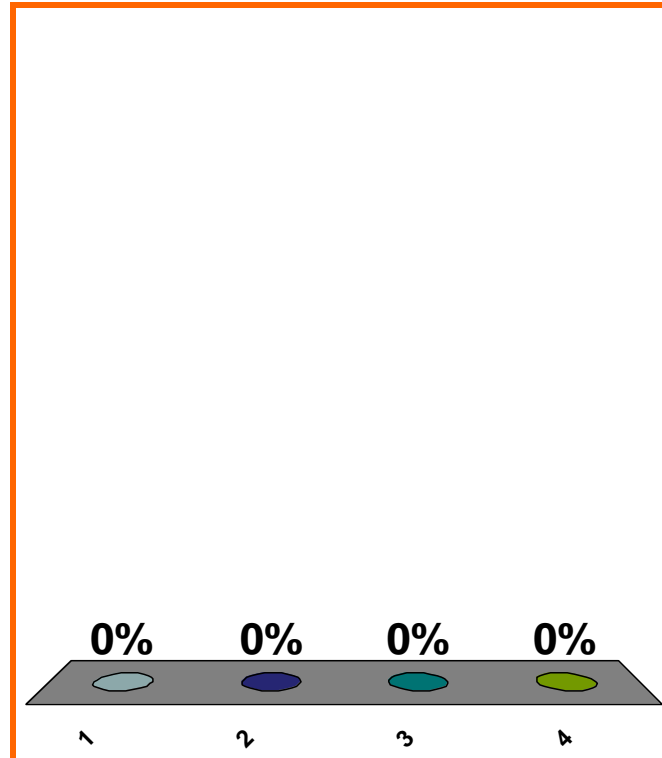
(a) $(3)(5^3) - (2)(5) + 8$

(b) $-\infty$

(c) ∞

(d) none of the above

Correct answer: DNE



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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LOOK AHEAD
Topic 0250

0 pts

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0170-1. Use the graph of f given below to find the value of each quantity, if it exists.

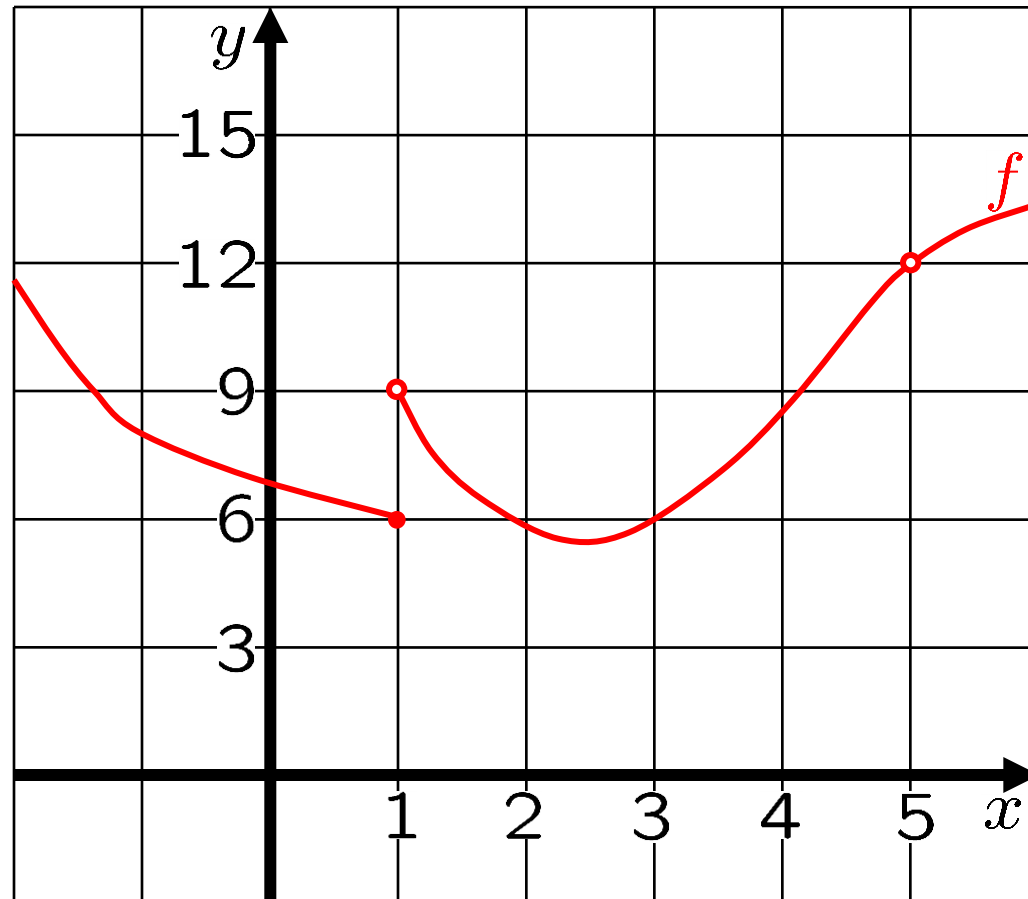
(a) $\lim_{x \rightarrow 1^-} f(x)$

(b) $\lim_{x \rightarrow 1^+} f(x)$

(c) $\lim_{x \rightarrow 1} f(x)$

(d) $\lim_{x \rightarrow 5} f(x)$

(e) $f(5)$



0170-2. Use the graph of f given below to find the value of each quantity, if it exists.

(a) $\lim_{x \rightarrow 1^-} f(x)$

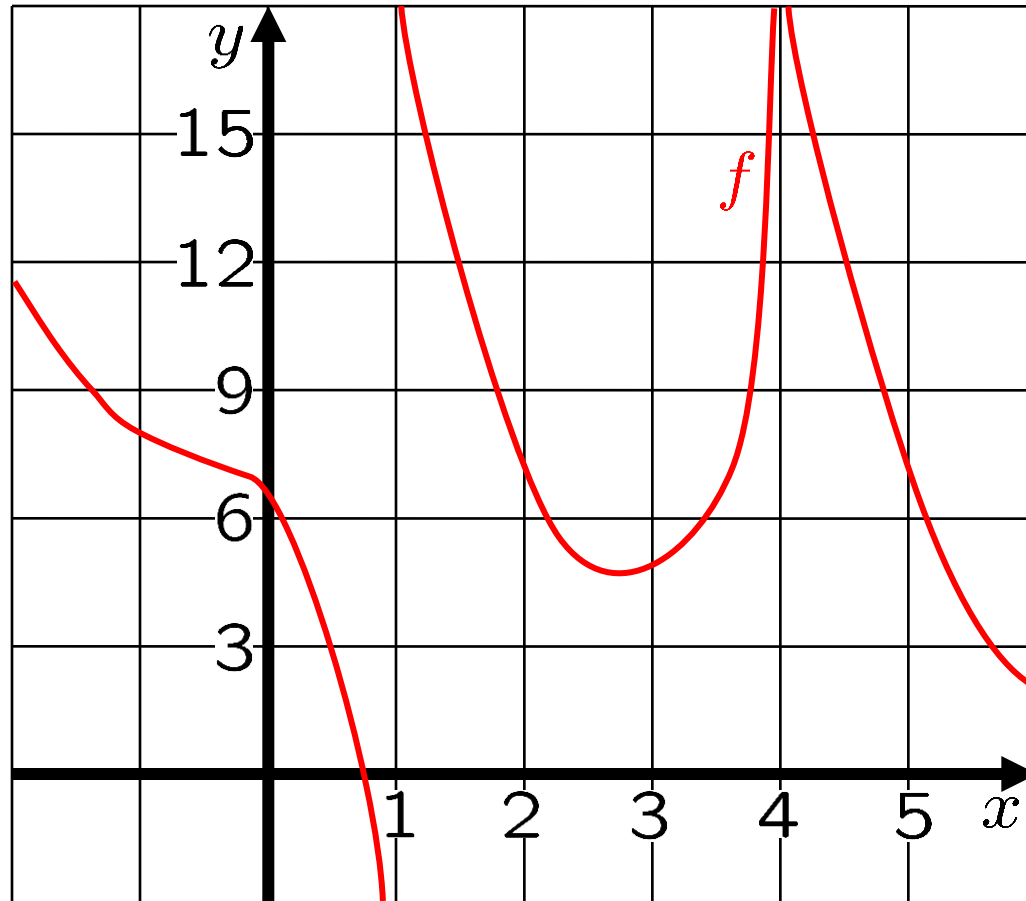
(b) $\lim_{x \rightarrow 1^+} f(x)$

(c) $\lim_{x \rightarrow 1} f(x)$

(d) $\lim_{x \rightarrow 4^-} f(x)$

(e) $\lim_{x \rightarrow 4^+} f(x)$

(f) $\lim_{x \rightarrow 4} f(x)$



0170-3. Show a graph of a function h s.t.

OLD

$$\lim_{x \rightarrow 2^-} h(x) = 7, \quad \lim_{x \rightarrow 2^+} h(x) = 6, \quad h(2) = 5,$$

$$\lim_{x \rightarrow 3} h(x) = -\infty,$$

$$\lim_{x \rightarrow 4^-} h(x) = \infty, \quad \lim_{x \rightarrow 4^+} h(x) = -\infty,$$

$$\lim_{x \rightarrow -\infty} h(x) = -3 \quad \text{and} \quad \lim_{x \rightarrow \infty} h(x) = 1.$$

0170-5. a. Compute $\lim_{x \rightarrow 1^-} \frac{2x + 3}{x - 1}$,

or explain why the limit
does not exist.

b. Compute $\lim_{x \rightarrow 1^+} \frac{2x + 3}{x - 1}$,

or explain why the limit
does not exist.

c. Compute $\lim_{x \rightarrow 1} \frac{2x + 3}{x - 1}$,

or explain why the limit
does not exist.

tangent slopes for $y = x^3$, esp. at $x = 5$.

$$\lim_{h \rightarrow 0} \frac{(5 + h)^3 - 5^3}{h}$$

$$\lim_{\Delta x \rightarrow 0} \frac{(5 + \Delta x)^3 - 5^3}{\Delta x}$$

LOOK AHEAD

differentiate polynomials

differentiate all 6 trig functions

$$\lim_{x \rightarrow 0} [\sin(1/x)]$$

$$\lim_{x \rightarrow 0} [x(\sin(1/x))]$$

$$\lim_{x \rightarrow 0} \left[\frac{2x^3 + x^2}{8x^5 + 3x^4 - 7x^3} \right]$$

$f'(3)$, when $f(x) = 1/x$

derivative of ln

product, quotient, chain rules

SAVE THE
SESSION
DATA

RETURN TO
PRESENTATION