

Calculus

M 17 September 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

$$f(1) = 800$$

$$f(3) = 200$$

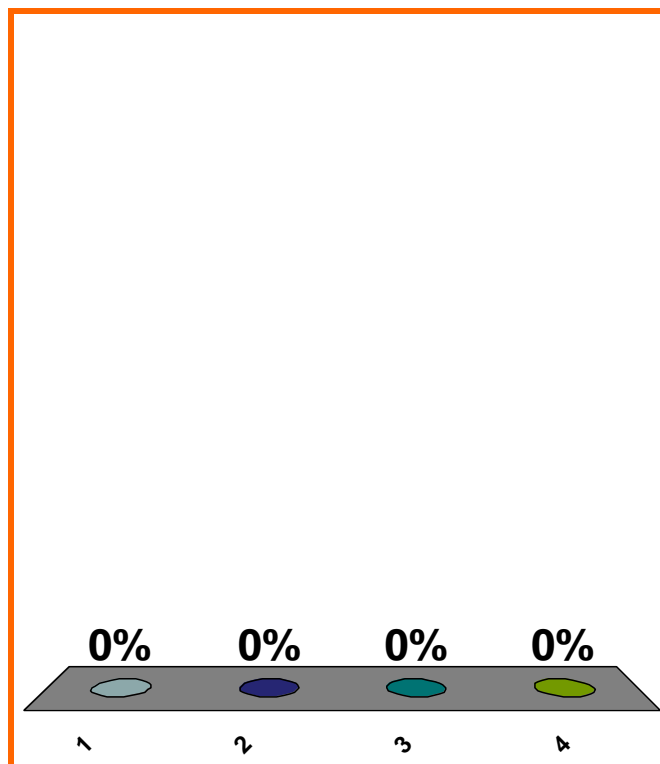
avg rate of change?

(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										

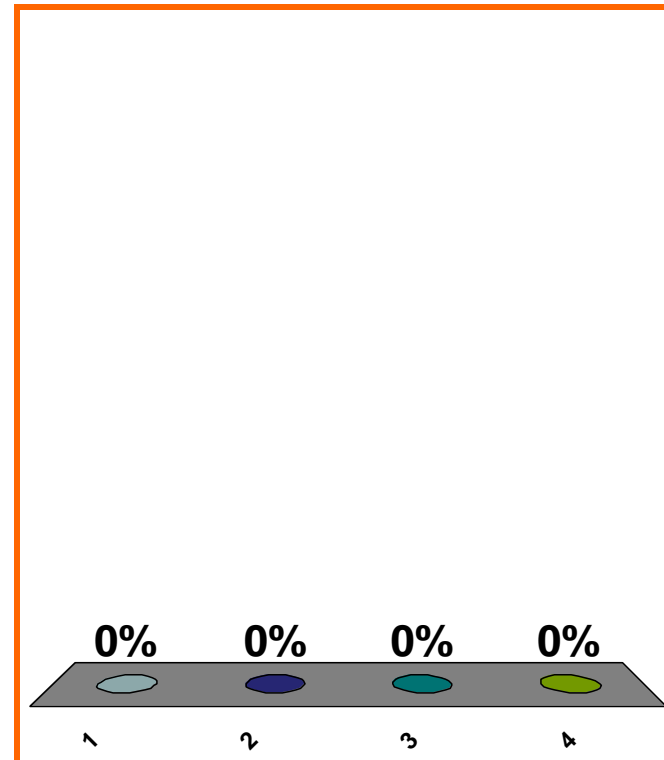
$$\lim_{x \rightarrow 0} \frac{3x^3 + 2x}{x} = ??$$

(a) 0

(b) 2

(c) 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

0 of 5

Topic 0140

0 pts

6

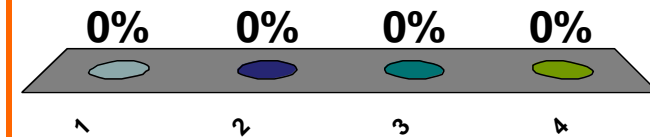
$$\lim_{x \rightarrow \infty} f(x) = -\infty$$

(a) x very pos $\Rightarrow f(x)$ very neg

(b) x very neg $\Rightarrow f(x)$ very pos

(c) $x \approx 0, x \neq 0 \Rightarrow f(x)$ very neg

(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 0150

0 pts

7

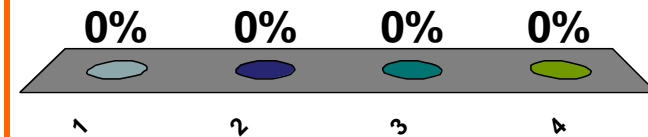
$$\lim_{x \rightarrow 2^-} f(x) = -\infty$$

(a) $x \approx 2, x \neq 2 \Rightarrow f(x)$ very pos

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

(c) $x \approx 2, x < 2 \Rightarrow f(x)$ very neg

(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

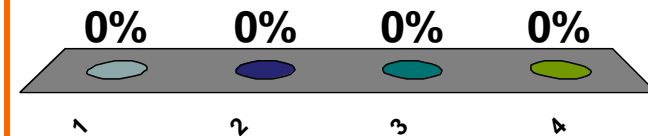
$$\lim_{x \rightarrow 2} f(x) = -\infty$$

(a) $x \approx 2, x \neq 2 \Rightarrow f(x)$ very neg

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

(c) $x \approx 2, x < 2 \Rightarrow f(x)$ very neg

(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

0 pts

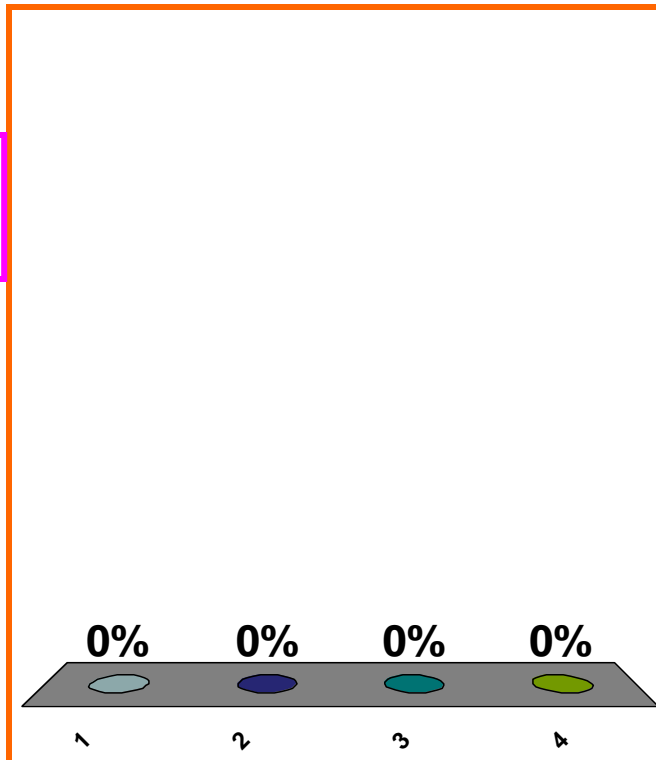
$$\lim_{x \rightarrow 2} f(x) = -\infty$$

(a) $x \approx 2 \Rightarrow f(x)$ very neg

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

(c) $x \approx 2, x < 2 \Rightarrow f(x)$ very neg

(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

0 pts

10

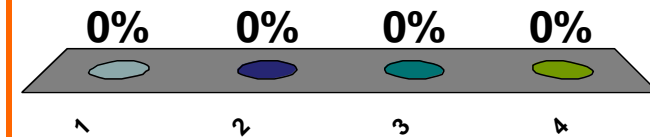
$$(a) x \approx 2 \Rightarrow f(x) \approx 7$$

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

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

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

(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

0 of 5

Topic 0150

0 pts

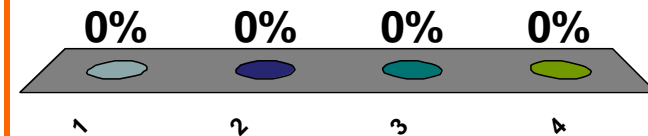
(a) $x \approx 2 \Rightarrow f(x)$ very neg

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

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

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

(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 0150

0 pts

12

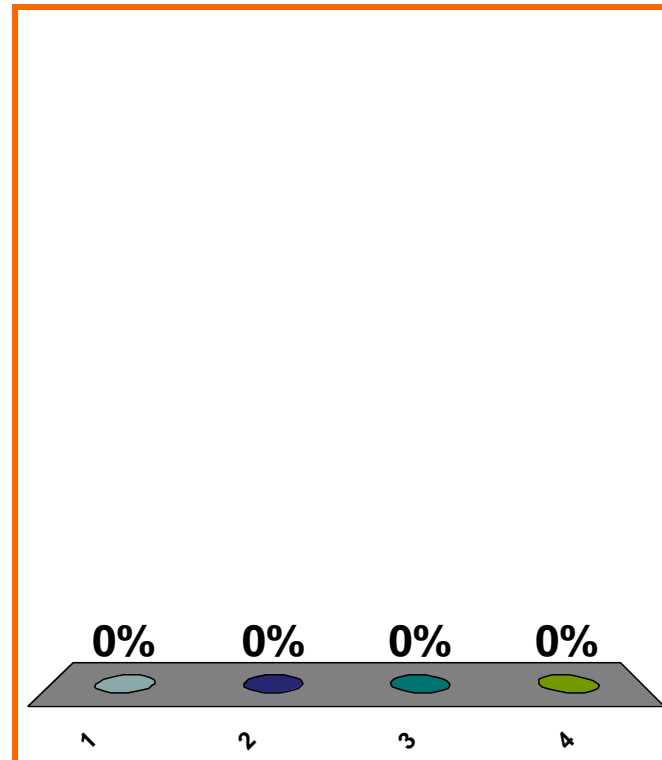
$$\lim_{x \rightarrow 5} (3x^3 - 2x + 8)$$

(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

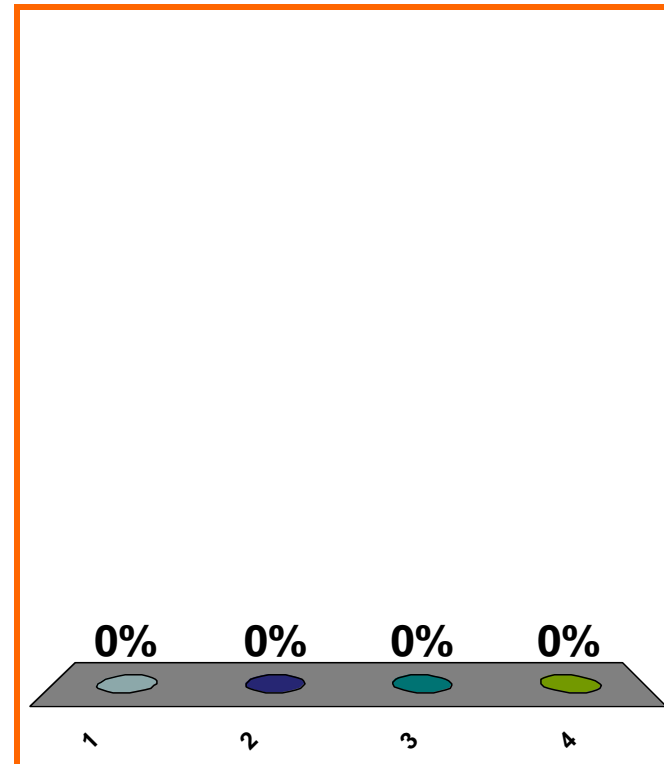
$$\lim_{x \rightarrow 5} \left(\frac{3x^3 - 2x + 8}{x - 4} \right)$$

(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

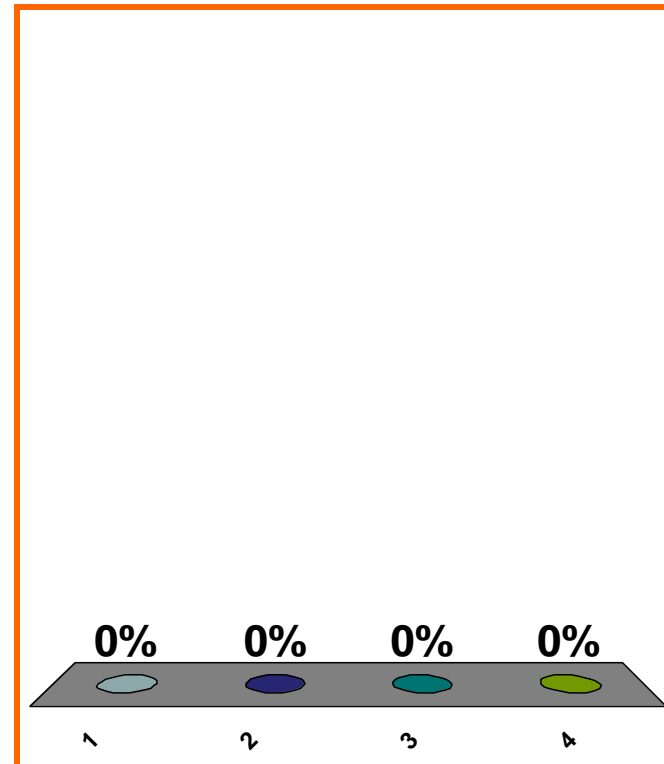
$$3x^3 + 2x \underset{x \rightarrow 0}{\sim} ??$$

(a) $3x^3$

(b) 0

(c) $2x$

(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

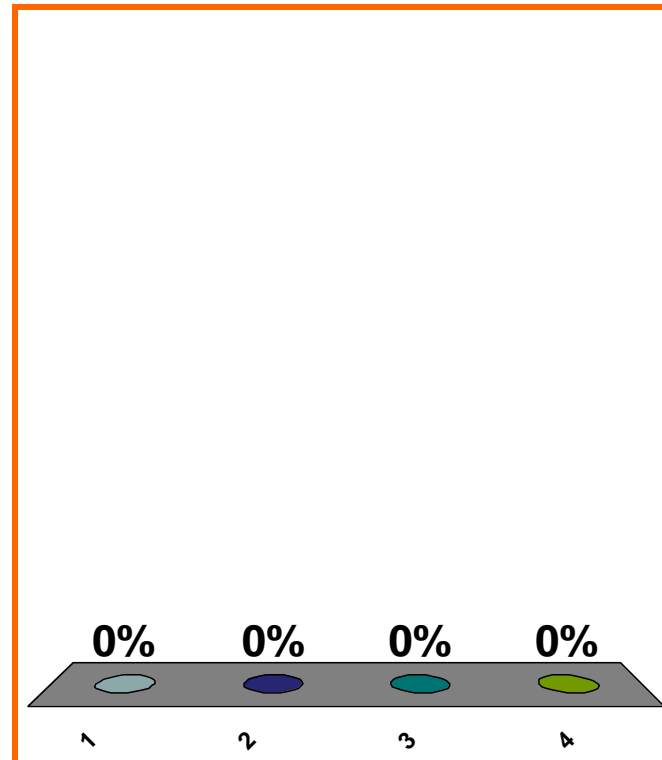
$$4x^5 - 3x^3 + 8x^2 \quad x \rightarrow 0 \quad ??$$

(a) $4x^5$

(b) $8x^2$

(c) 8

(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

$$6x^5 + 7x^4 - 8x^3 \quad x \rightarrow 0 \quad ??$$

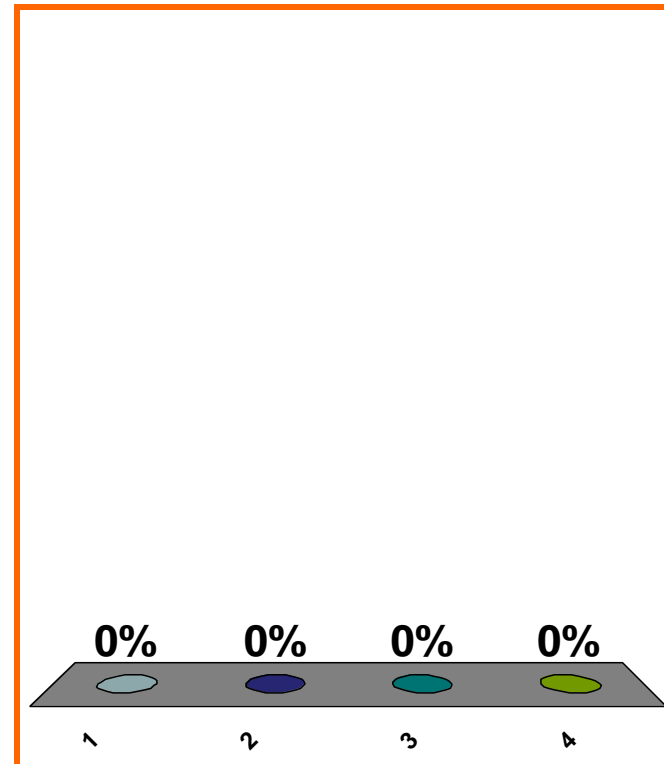
(a) $6x^5$

(b) $7x^4$

(c) $8x^3$

(d) none of the above

Correct answer: $-8x^3$



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

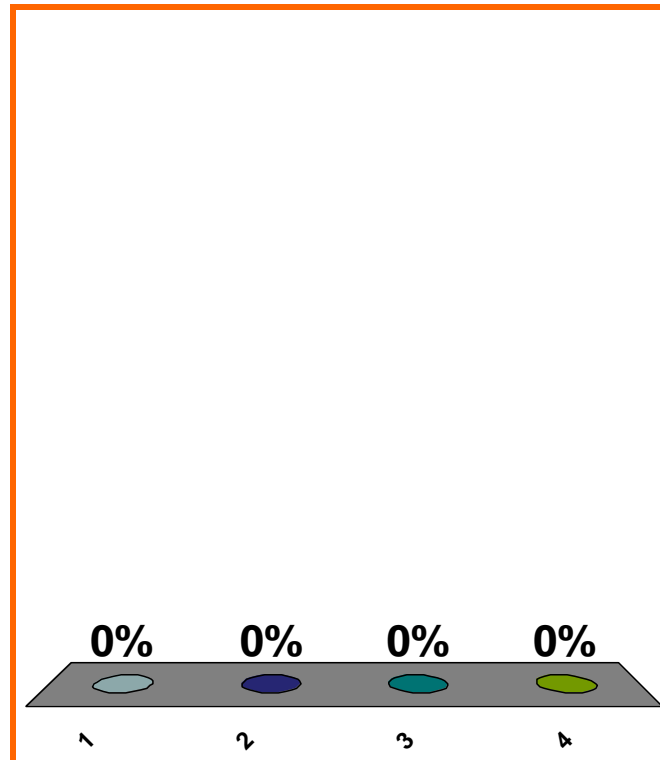
$$\lim_{x \rightarrow 0} \left[\frac{6x^5 + 7x^4 - 8x^3}{7x^5 - 2x^4 + 9x^3} \right] = ??$$

(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

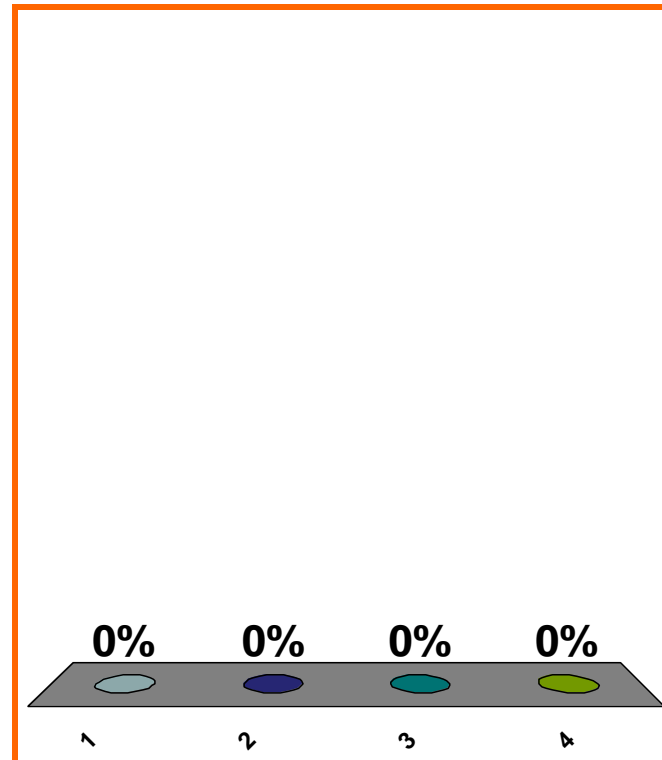
$$\lim_{x \rightarrow 0} \left[\frac{6x^8 + 7x^4 - 8x^3}{7x^5 - 2x^4 + 9x^3} \right] = ??$$

(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

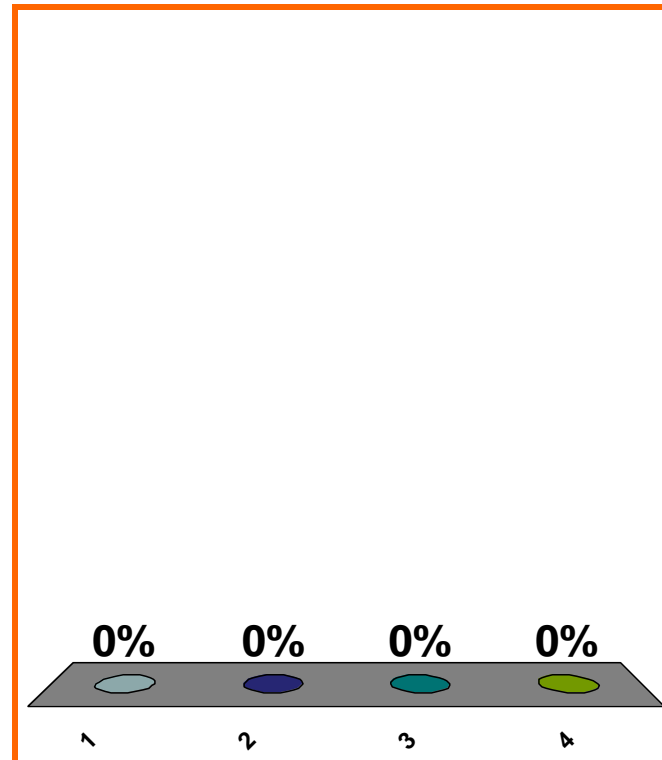
$$\lim_{x \rightarrow 0} \left[\frac{4x^6 - 7x^4 + 4x}{-2x^3 + 7x^2 - 4x} \right] = ??$$

(a) -2

(b) 1

(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

$$\lim_{x \rightarrow 2} \left((\sin x) + \sqrt{x + 1} \right)$$

(a) DNE

(b) $-\infty$

(c) $(\sin 2) + \sqrt{2}$

(d) none of the above

Correct answer: $(\sin 2) + \sqrt{3}$

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

$$P(x) = (x - 3)^8(x^2 + x + 4)$$
$$Q(x) = (x - 3)^7(5x^9 + 9x - 7)$$

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

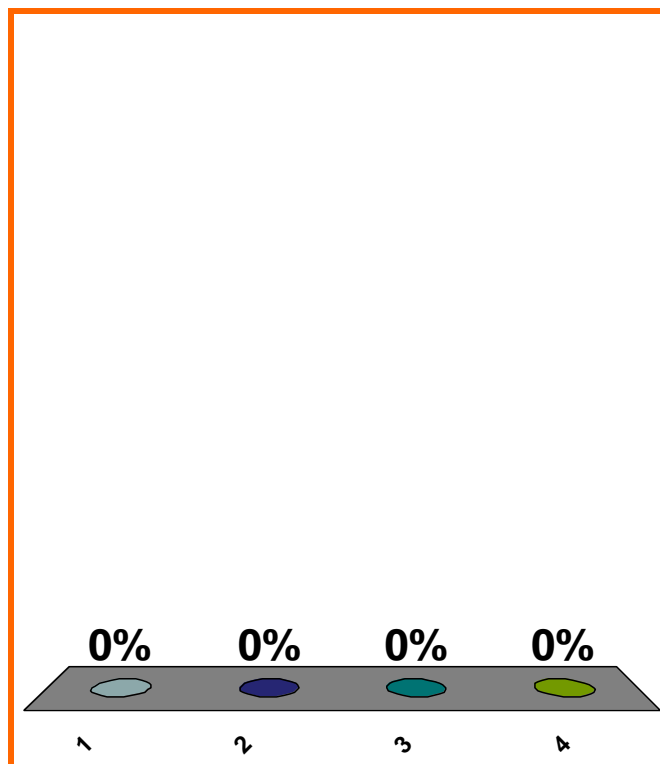
(a) 1

(b) ∞

(c) $-\infty$

(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

$$P(x) = (x - 3)^7(x^2 + x + 4)$$

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

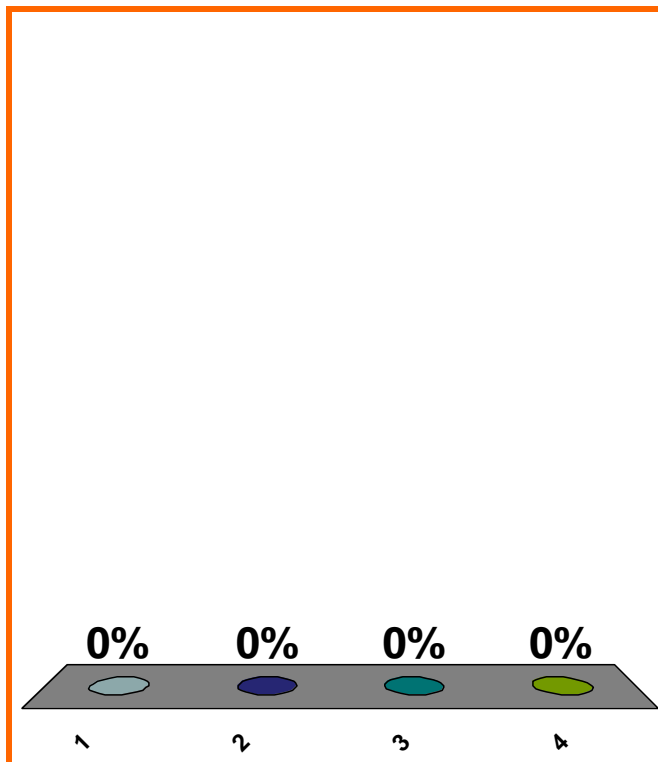
$$\lim_{x \rightarrow 3^+} \frac{P(x)}{Q(x)} = ??$$

(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

0 pts

23

$$P(x) = (x - 3)^7(x^2 + x + 4)$$

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

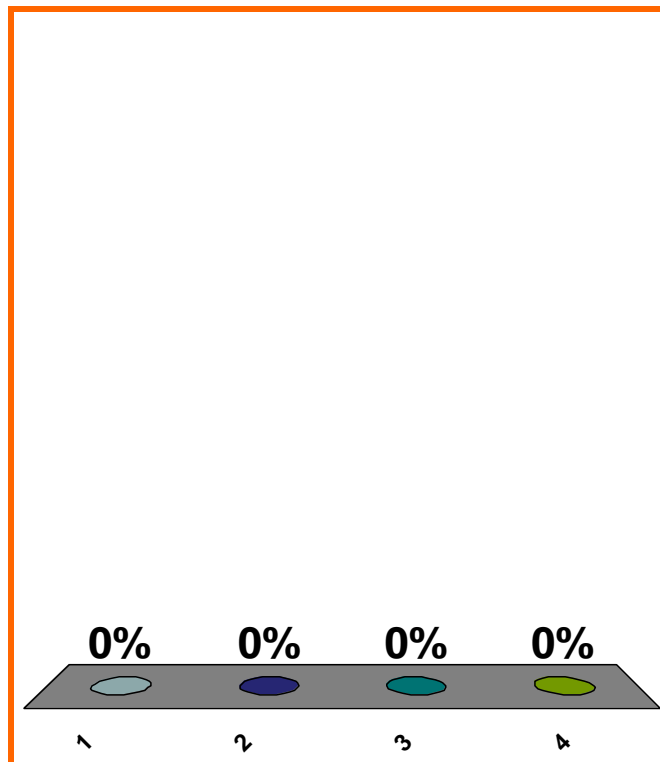
$$\lim_{x \rightarrow 3^-} \frac{P(x)}{Q(x)} = ??$$

(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

$$P(x) = (x - 3)^7(x^2 + x + 4)$$
$$Q(x) = (x - 3)^8(5x^9 + 9x - 7)$$

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

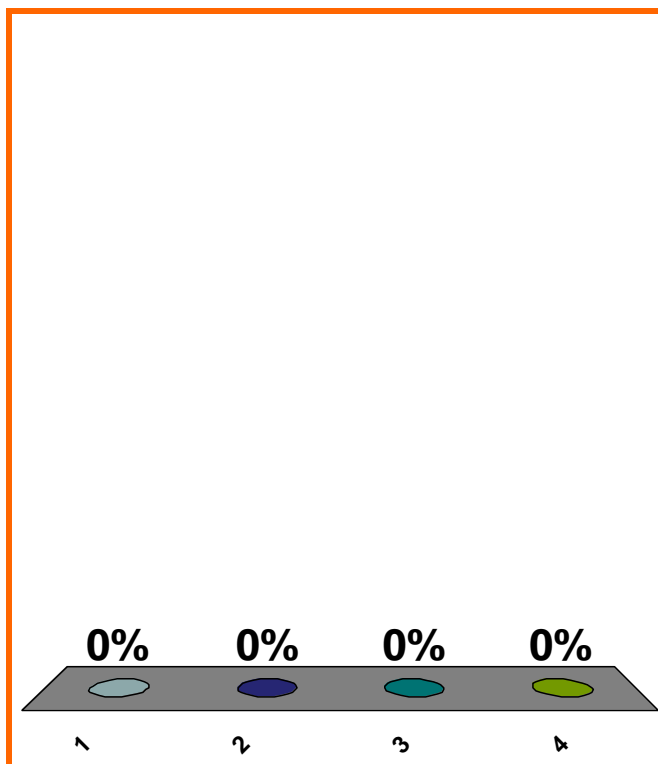
(a) 0

(b) ∞

(c) $-\infty$

(d) none of the above

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

$$P(x) = (x - 3)^5(x^2 + x + 4)$$
$$Q(x) = (x - 3)^8(5x^9 + 9x - 7)$$

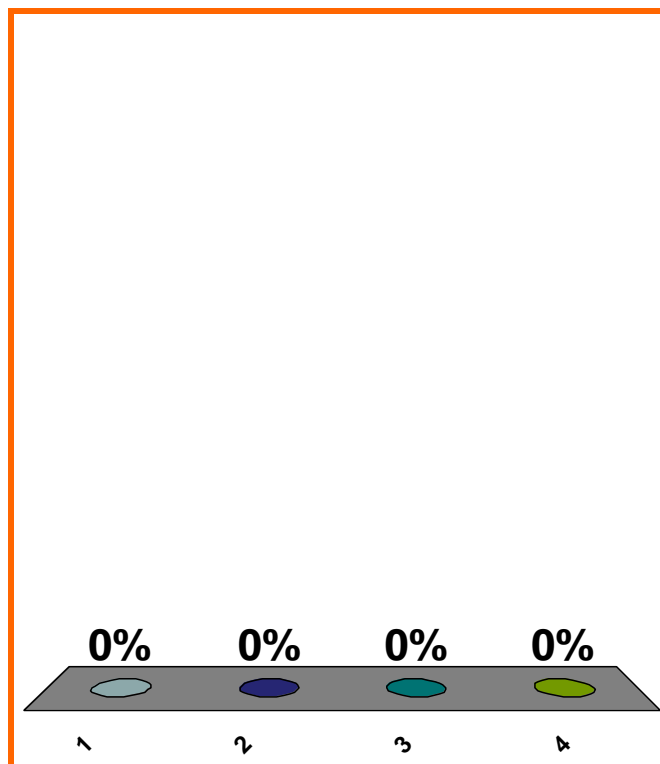
$$\lim_{x \rightarrow 3^-} \frac{P(x)}{Q(x)} = ??$$

(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

$$P(x) = (x - 3)^5(-x^2 - x - 4)$$
$$Q(x) = (x - 3)^8(5x^9 + 9x - 7)$$

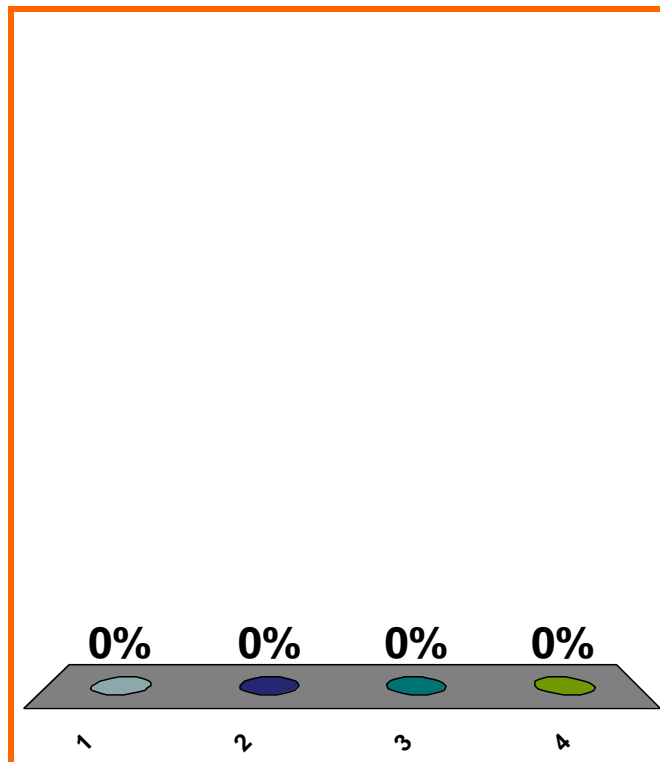
$$\lim_{x \rightarrow 3^+} \frac{P(x)}{Q(x)} = ??$$

(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

0 pts

27

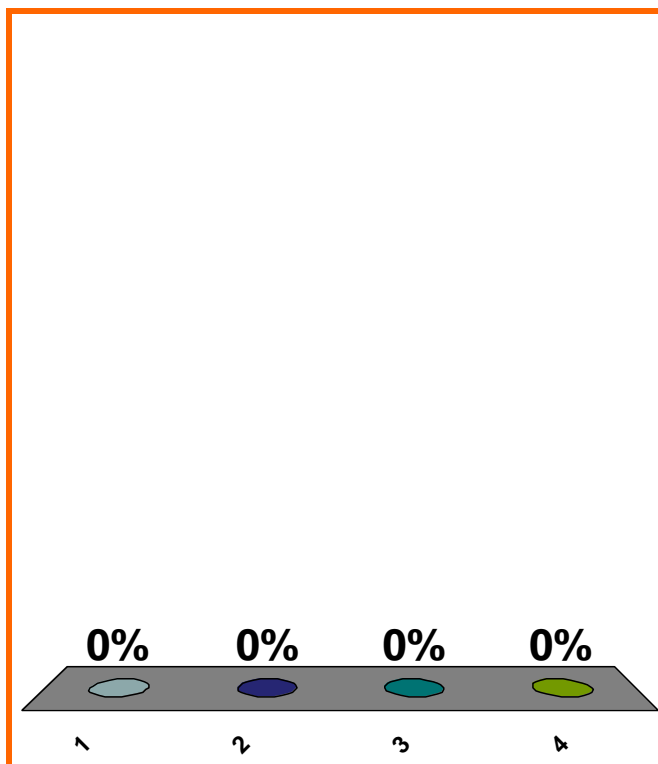
$$\lim_{x \rightarrow -1} \left[\frac{x^2 + x}{2x + 5} \right]$$

(a) 1/3

(b) 0

(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

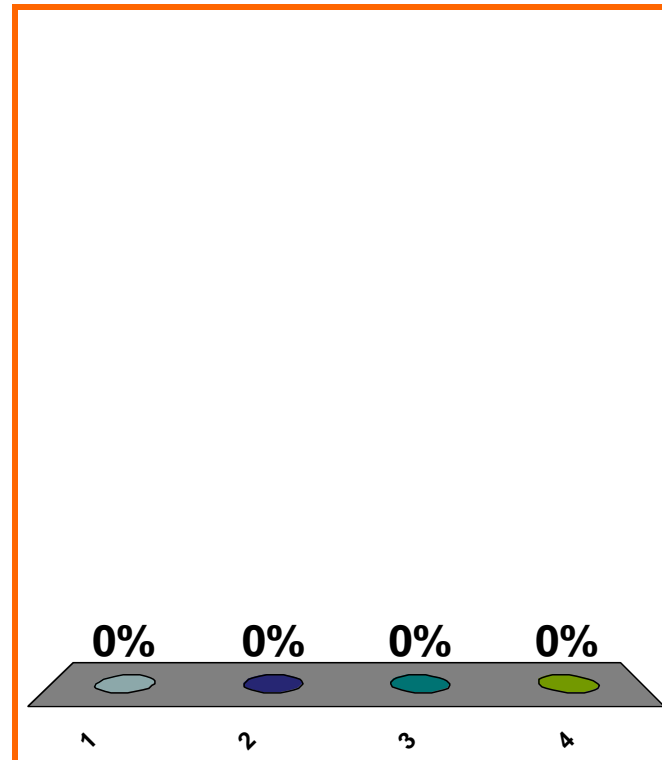
$$\sin x \underset{x \rightarrow 0}{\sim} ??$$

(a) x

(b) $\cos x$

(c) $-\cos x$

(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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Topic 0230

0 pts

29

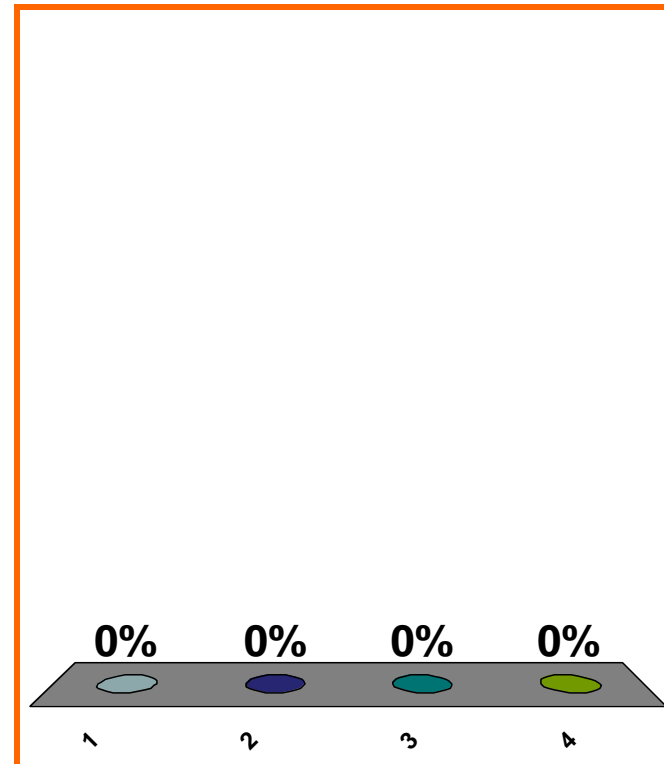
$$[\sin x] - x \quad x \sim 0 \quad ??$$

(a) $-x^3/6$

(b) 1

(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 0230

0 pts

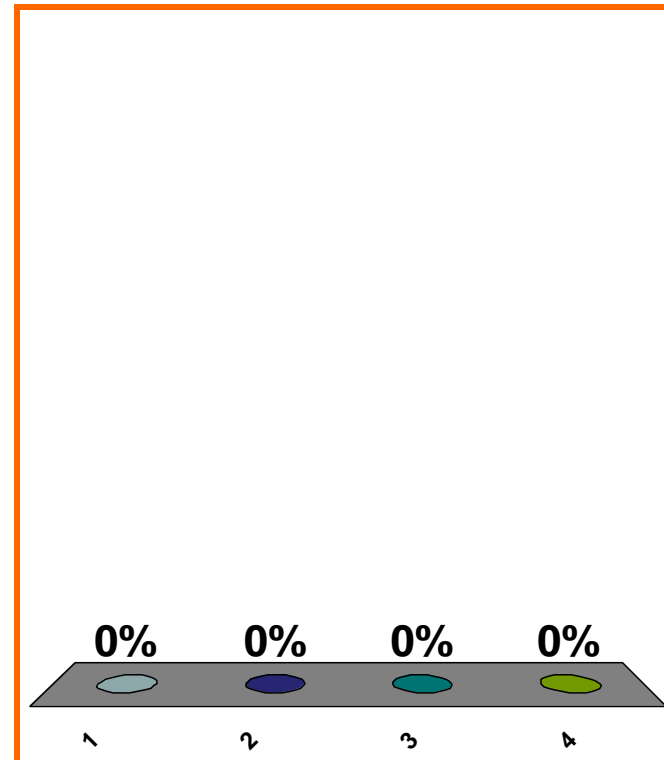
$\cos x \sim$ $x \rightarrow 0$??

(a) $-x^3/6$

(b) 1

(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 0230

0 pts

31

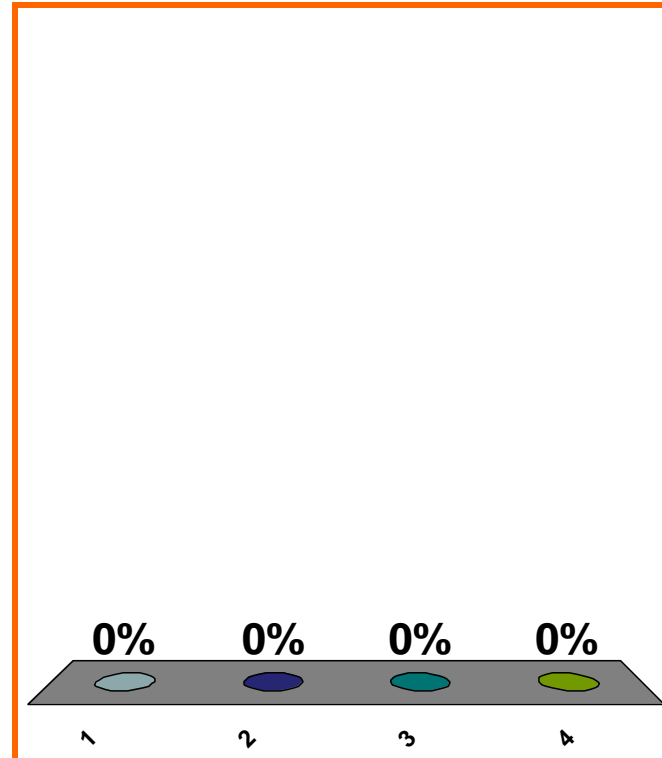
$$[\cos x] - 1 \quad x \sim 0 \quad ??$$

(a) $-x^2/2$

(b) 1

(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

$$\sin x \underset{x \rightarrow \pi/2}{\sim} ??$$

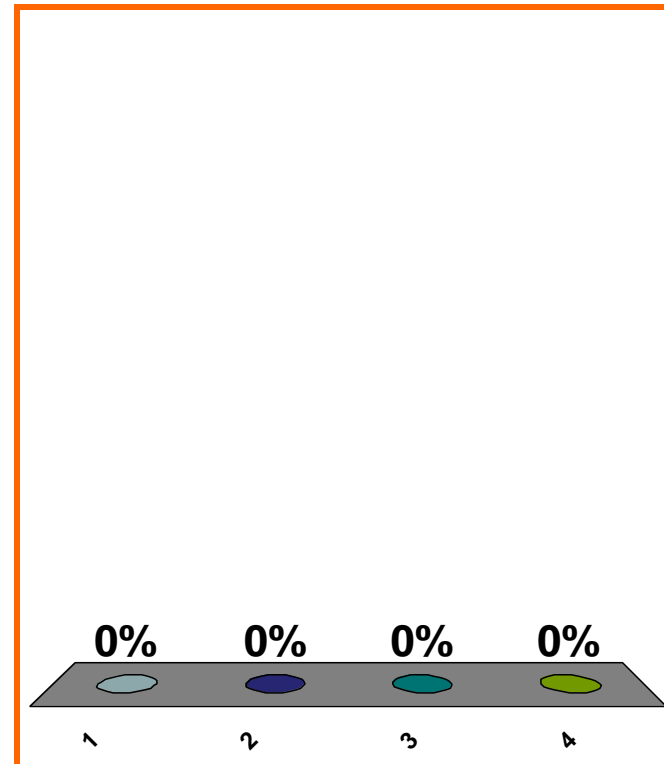
(a) $-x^3/6$

(b) 1

(c) x

(d) none of the above

Correct answer: 1



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

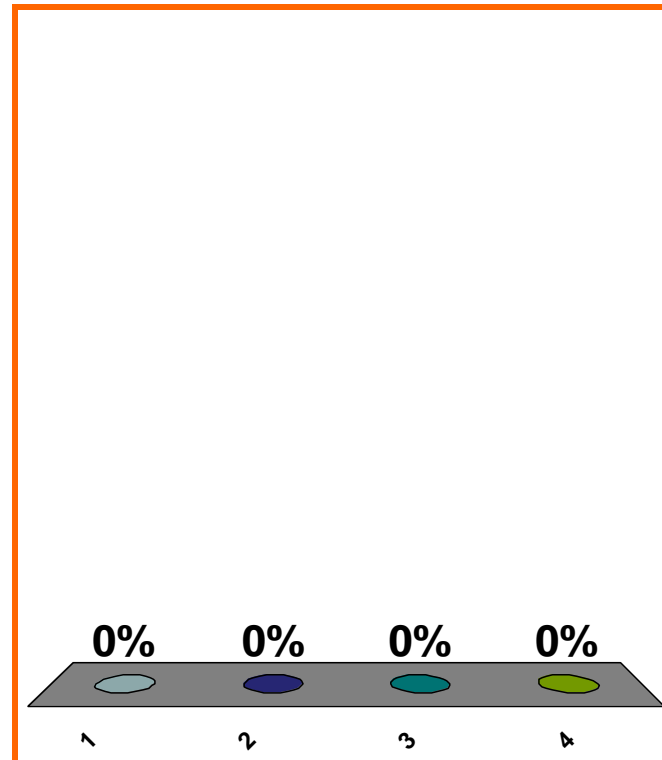
$$3x^3 + 2x \underset{x \rightarrow 0}{\sim} ??$$

(a) $3x^3$

(b) 0

(c) $2x$

(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

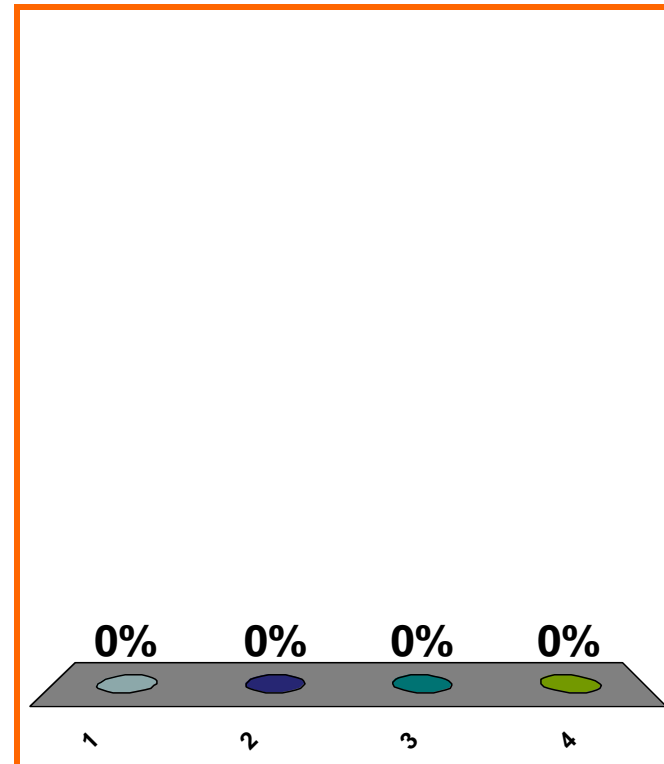
$$\lim_{x \rightarrow 0} \frac{3x^3 + 2x}{\sin x} = ??$$

(a) 0

(b) 2

(c) 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

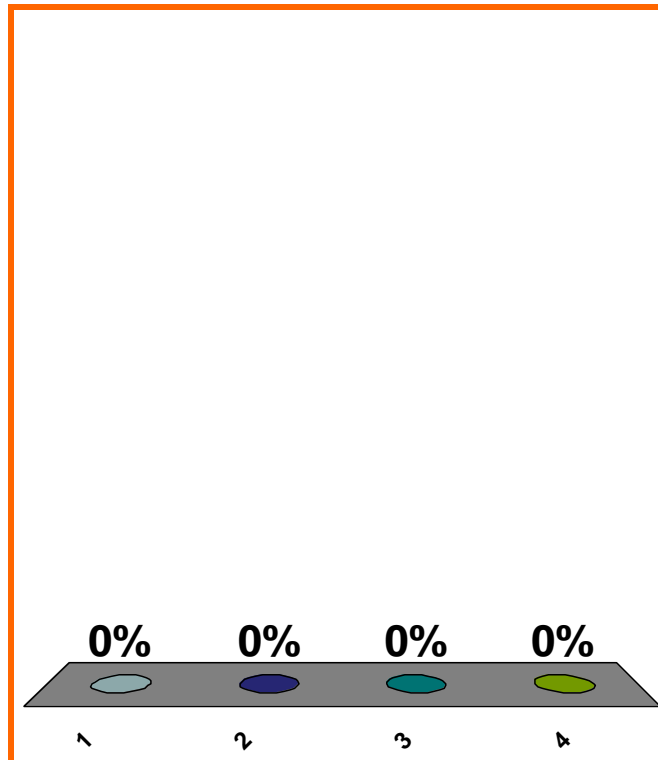
$$\lim_{x \rightarrow 0} \left[\frac{4x^6 - 7x^4 + 4x}{-2x^3 + 7x^2 - 4x} \right] = ??$$

(a) -2

(b) 1

(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

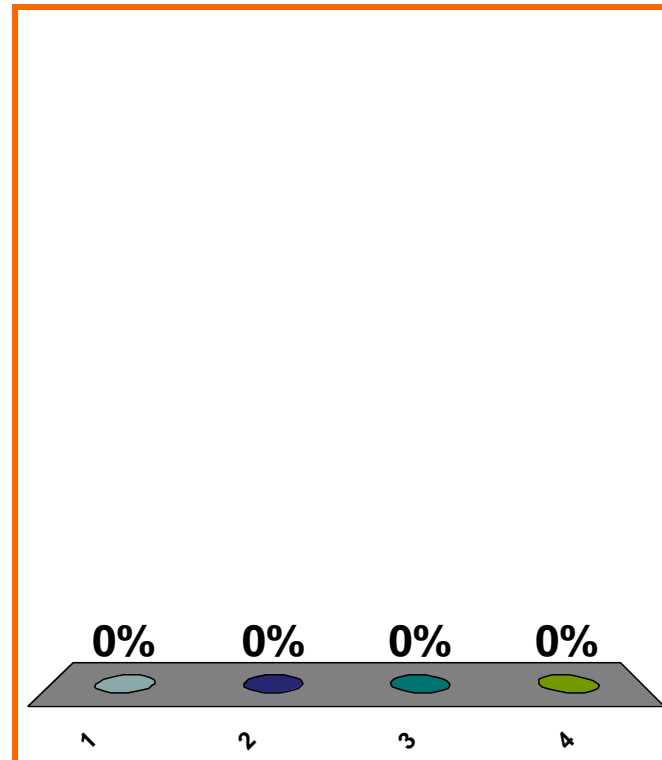
$$\lim_{x \rightarrow 0} \left[\frac{4x^6 - 7x^4 + 4x}{-2x^3 + 7x^2 - 4 \sin x} \right] = ??$$

(a) -2

(b) 1

(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

0 of 5

Topic 0230

0 pts

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$$\lim_{t \rightarrow 0} \left[\frac{2t^5 + 8t^4}{t^2(\sin^2 t)} \right]$$

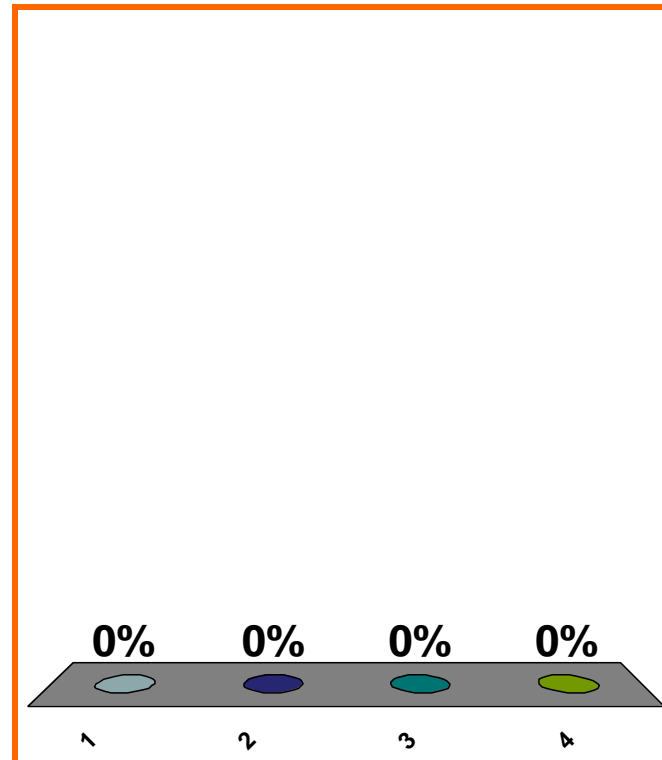
(a) 0

(b) ∞

(c) $-\infty$

(d) none of the above

Correct answer: 8



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

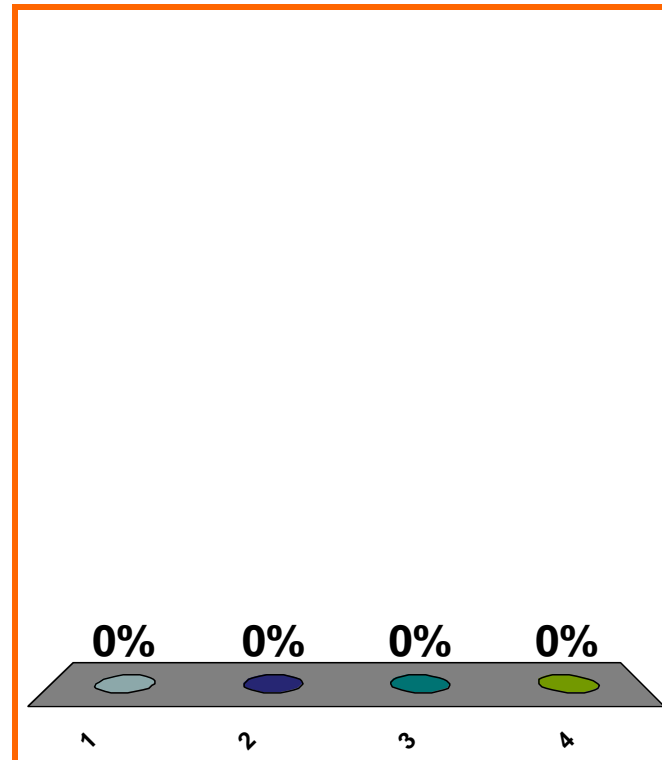
$$\lim_{t \rightarrow 0^+} \left[\frac{\sqrt{4t^6 + 9t^4}}{t(\sin t)} \right] = ??$$

(a) DNE

(b) ∞

(c) 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

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

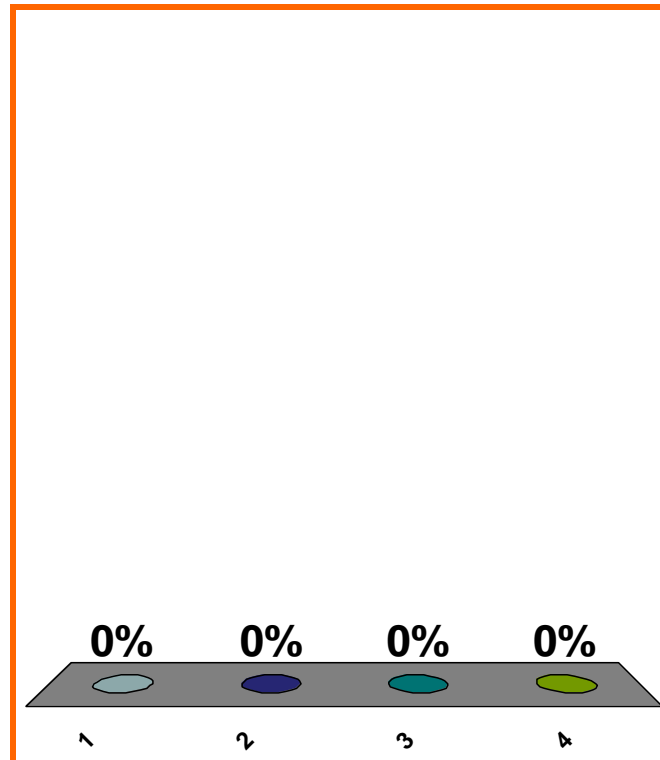
$$\lim_{x \rightarrow 0} \left[\frac{x^3 + x^4}{x - \sin x} \right] = ??$$

(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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0 pts

40

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

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

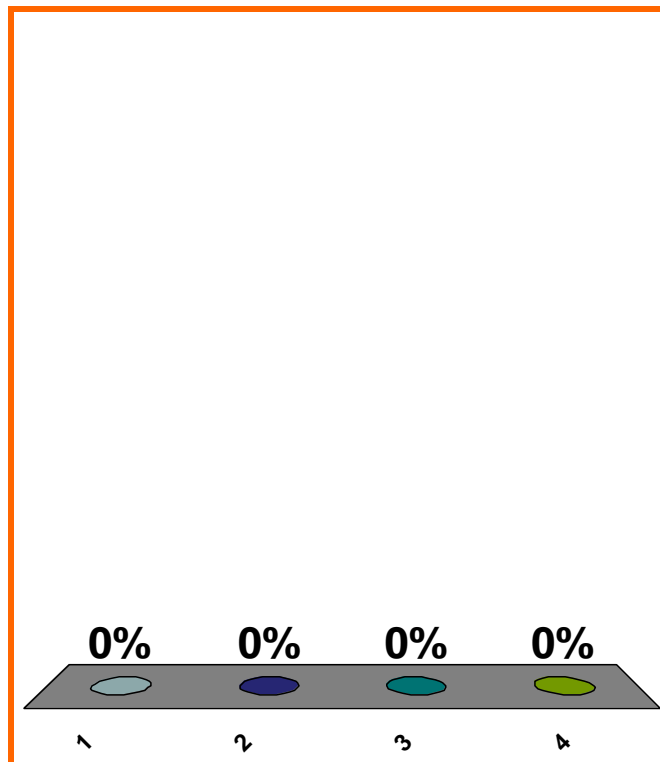
(a) DNE

(b) $-1/6$

(c) $1/6$

(d) none of the above

Correct answer: 6



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 0230

0 pts

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

chain rule

differentiate exp. fns, log fns