Calculus
M 30 January 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

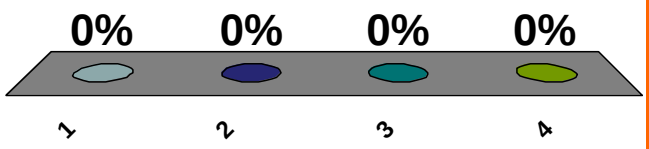
Which is a linear combination of $\sin x$ and $\cos x$?

(a) 0

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

(c) e^x

(d) none of the above



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Domain of $\sqrt{x}$ is ??

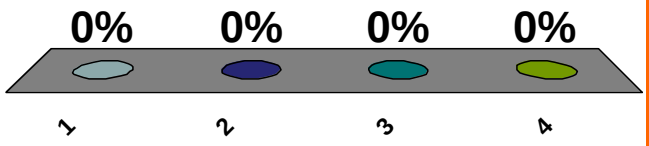
(a) $x \in \mathbb{R}$

(b) $x \in \mathbb{Q}$

(c) $x \in (0, \infty)$

(d) none of the above

Correct answer: $x \in [0, \infty)$



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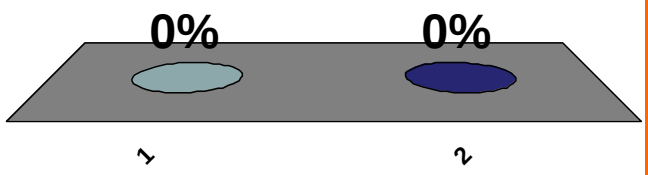
T or F:

$(-\infty, 5]$ is compact

(a) True

(b) False



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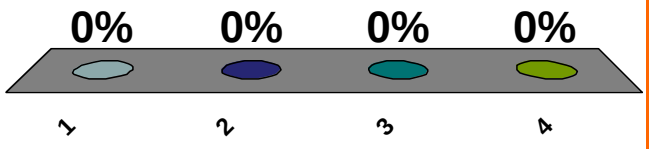
$$(5q^3 - 2q + 4)(2q + 7) + (q^3)(2q^7 - 9q + 4)$$

(a) a polynomial in q

(b) rational, nonpolynomial in q

(c) transcendental in q

(d) none of the above



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0 of 5

Topic 0140

0 pts

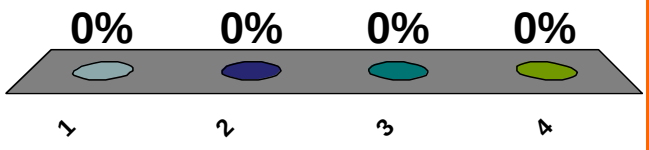
$$\frac{5q^3 - 2q + 4}{2q + 7} + \frac{(q^3 + 4)(2q - 3)}{2q^7 - 9q + 4}$$

(a) a polynomial in q

(b) rational, nonpolynomial in q

(c) transcendental in q

(d) none of the above



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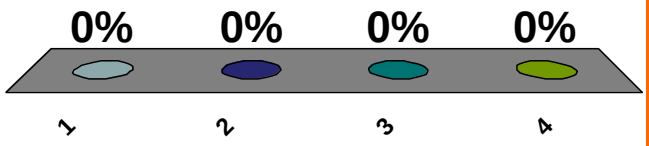
$$\sin\left(\frac{3t^2+5t-1}{2t^3+t^2-1}\right)$$

(a) a polynomial in t

(b) rational, nonpolynomial in t

(c) transcendental in t

(d) none of the above



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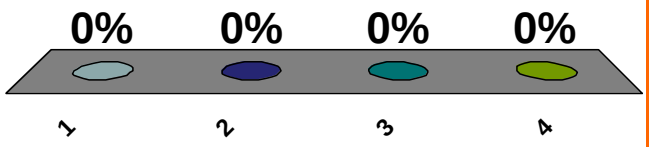
$x^2 + 3\sqrt{x} + 1$ is ??

(a) a polynomial in x

(b) rational, nonpolynomial in x

(c) algebraic, nonrational in x

(d) none of the above



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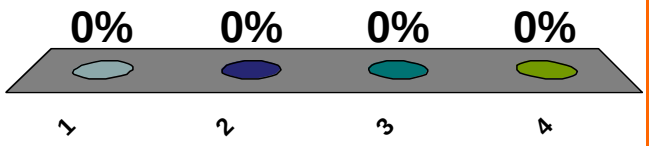
$$\frac{(q^2+1)(3q^3-2q^2+q-7)}{q^2+1}$$

(a) a polynomial in q

(b) rational, nonpolynomial in q

(c) transcendental in q

(d) none of the above



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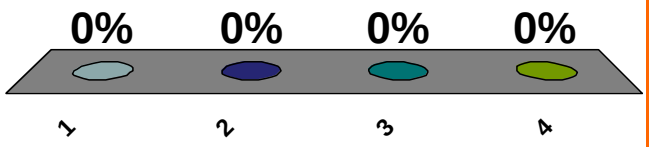
$$\frac{(q^2-1)(3q^3-2q^2+q-7)}{q^2-1}$$

(a) a polynomial in q

(b) rational, nonpolynomial in q

(c) transcendental in q

(d) none of the above



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distance from a to b?

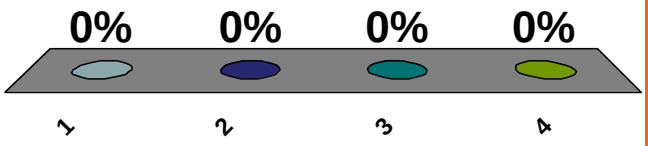
(a) $a - b$

(b) $b - a$

(c) $a + b$

(d) none of the above

Correct answer: $|a - b|$



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from position 5 to position 9
from time 3 to time 11

average velocity = ??

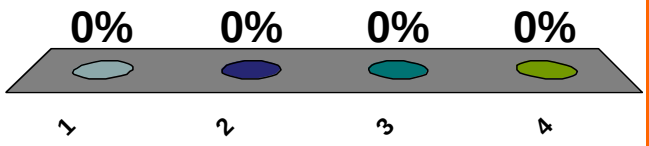
(a) 2

(b) 4

(c) 8

(d) none of the above

Correct answer: 1/2



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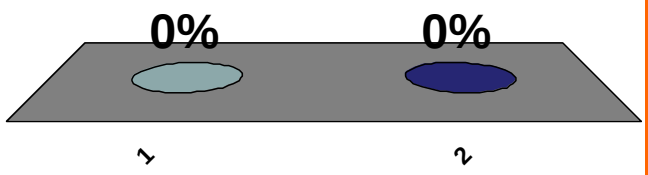
$$\forall x \in \mathbb{R}, \quad \frac{3x^3 + 2x}{x} = 3x^2 + 2$$

(a) True

(b) False



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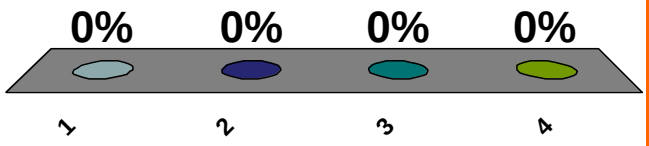
$$\frac{3x^3 + 2x}{x} \text{ is } \ldots$$

(a) a polynomial in x

(b) rational, nonpolynomial in x

(c) transcendental in x

(d) none of the above



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$$\left[\frac{3x^3+2x}{x}\right]_{x:\to 0} = ??$$

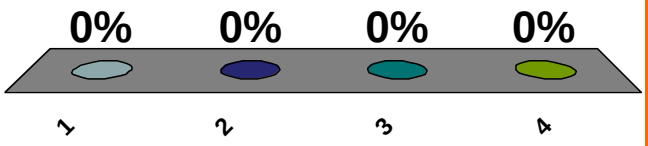
(a) 0

(b) 2

(c) 3

(d) none of the above

Correct answer: DNE



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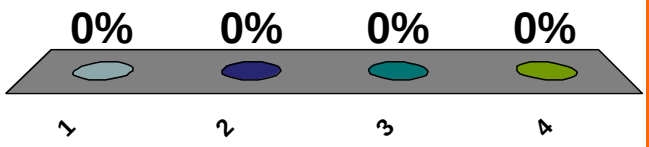
$$\lim_{x \to 0} \frac{3x^3 + 2x}{x} = ??$$

(a) 0

(b) 2

(c) 3

(d) none of the above



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Topic 0140

0 pts

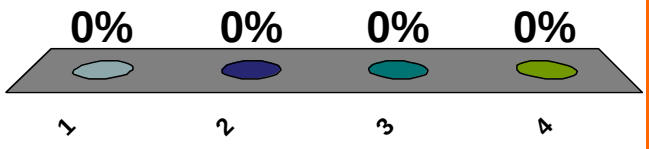
$$\lim_{x \to 0} \frac{3x^3 + 2x}{\sin x} = ??$$

(a) 0

(b) 2

(c) 3

(d) none of the above



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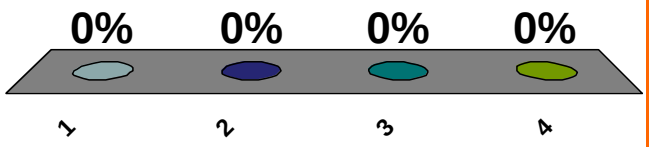
$$\lim_{x \to 2} \left((\sin x) + \sqrt{x+1} \right)$$

(a) DNE

(b) $-\infty$

(c) $(\sin 2) + \sqrt{3}$

(d) none of the above



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

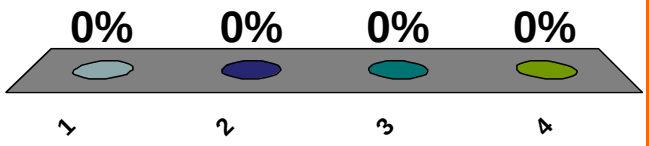
$$\lim_{x\to 3} \frac{P(x)}{Q(x)} = ??$$

(a) 0

(b) ∞

(c) $-\infty$

(d) none of the above



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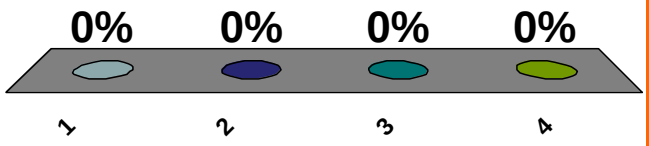
$$\lim_{x \to -1} \left[\frac{x^2 + x}{2x + 5} \right]$$

(a) 1/3

(b) 0

(c) DNE

(d) none of the above



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

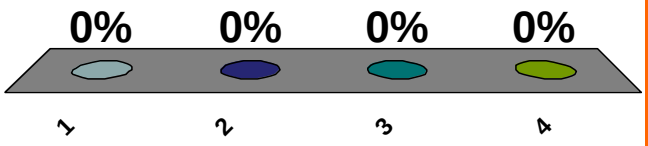
(a) 0

(b) ∞

(c) $-\infty$

(d) none of the above

Correct answer: 8



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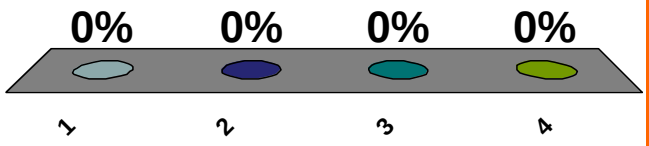
$$\lim_{x \to \infty} f(x) = -\infty$$

(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



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LOOK AHEAD

differentiate a polynomial

$(d/dx)(\ln x)$, $(d/dx)(\log_{10} x)$

practice chain rule

two problems with product, quotient, chain

From graph of f to domain of f'

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

continuity vs. continuity on interval

logarithmic derivatives

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

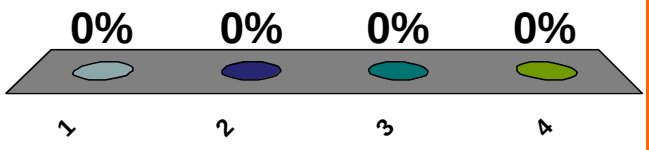
To get graph of $y + 1 = x^3$,
move graph of $y = x^3$ . . .

(a) right 1

(b) left 1

(c) down 1

(d) none of the above



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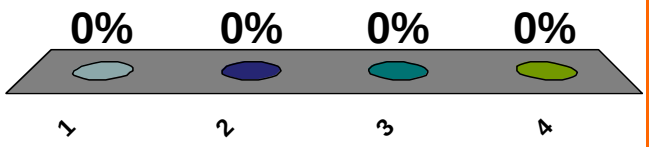
To get graph of $y^2 = \sin(x + \pi)$,
move graph of $y^2 = \sin(x)$ . . .

(a) right π

(b) left π

(c) down π

(d) none of the above



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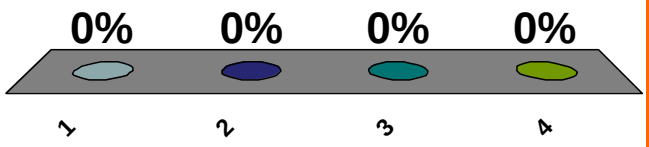
To get graph of $y^2 = \sin(x - \pi)$,
move graph of $y^2 = \sin(x)$ . . .

(a) right π

(b) left π

(c) down π

(d) none of the above



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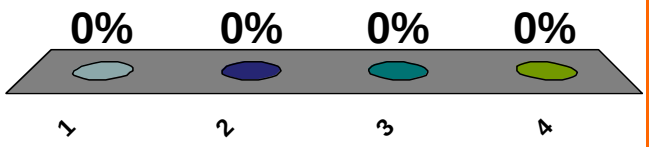
To get graph of $(y+\pi)^2 = \sin(x)$,
move graph of $y^2 = \sin(x)$ . . .

(a) right π

(b) left π

(c) down π

(d) none of the above



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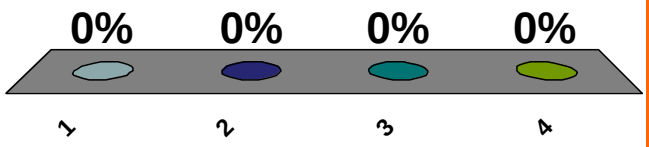
$\sin(\pi/3) = ??$

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

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

(c) $1/2$

(d) none of the above



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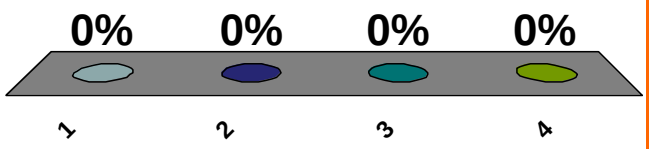
$\arcsin(\sqrt{3}/2) = ??$

(a) $\pi/3$

(b) $\pi/4$

(c) $\pi/6$

(d) none of the above



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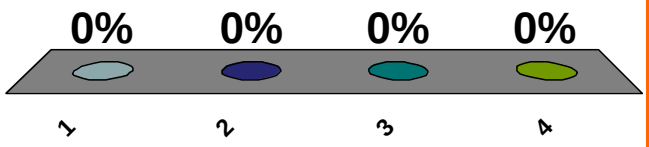
$\sin(3\pi/4) = ??$

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

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

(c) $1/2$

(d) none of the above



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Topic 0090

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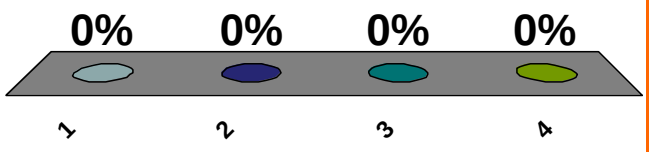
$\arcsin(\sqrt{2}/2) = ??$

(a) $\pi/3$

(b) $\pi/4$

(c) $\pi/6$

(d) none of the above



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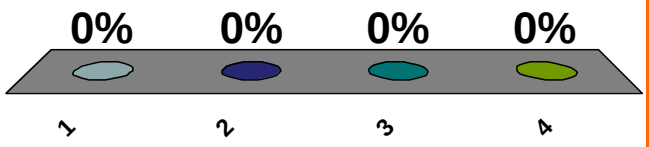
$$\frac{d}{dx}\left[(x^2)(\sin x)\right] = ??$$

(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

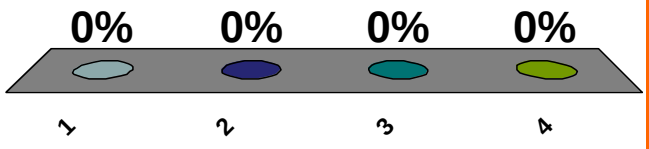
$$\frac{d}{dx}\left[\frac{\sin x}{x}\right] = ??$$

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

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

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

(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

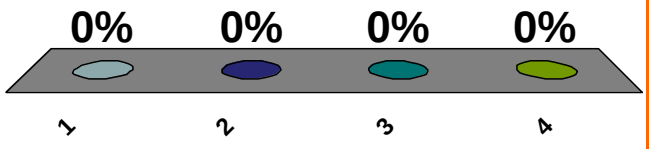
$$\lim_{x \to 5} \left(3x^3 - 2x + 8\right)$$

(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

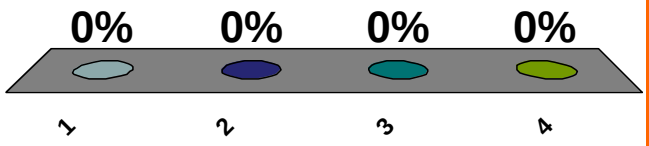
$$\lim_{x \to 5} \left(\frac{3x^3 - 2x + 8}{x - 4} \right)$$

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

(b) $-\infty$

(c) ∞

(d) none of the above



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

0 of 5

Topic 0190

0 pts

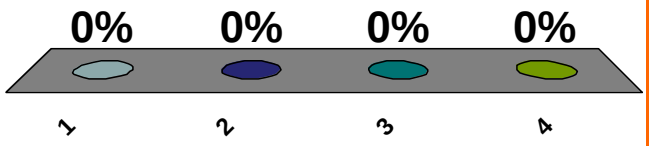
$$\lim_{x \to 5^+} \left(\frac{3x^3 - 2x + 8}{x - 5} \right)$$

(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

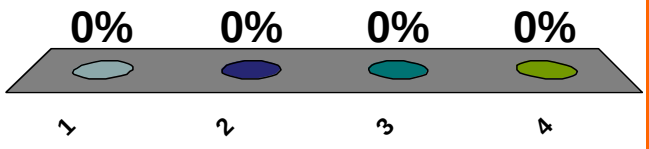
$$\lim_{x \to 5^-} \left(\frac{3x^3 - 2x + 8}{x - 5} \right)$$

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

(b) $-\infty$

(c) ∞

(d) none of the above



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

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

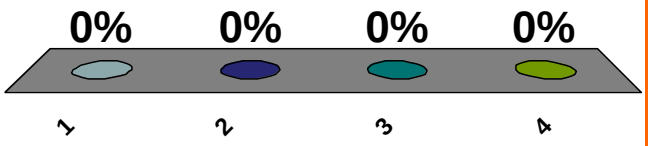
(a) $(3)(5^3) - (2)(5) + 8$

(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

OLD

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

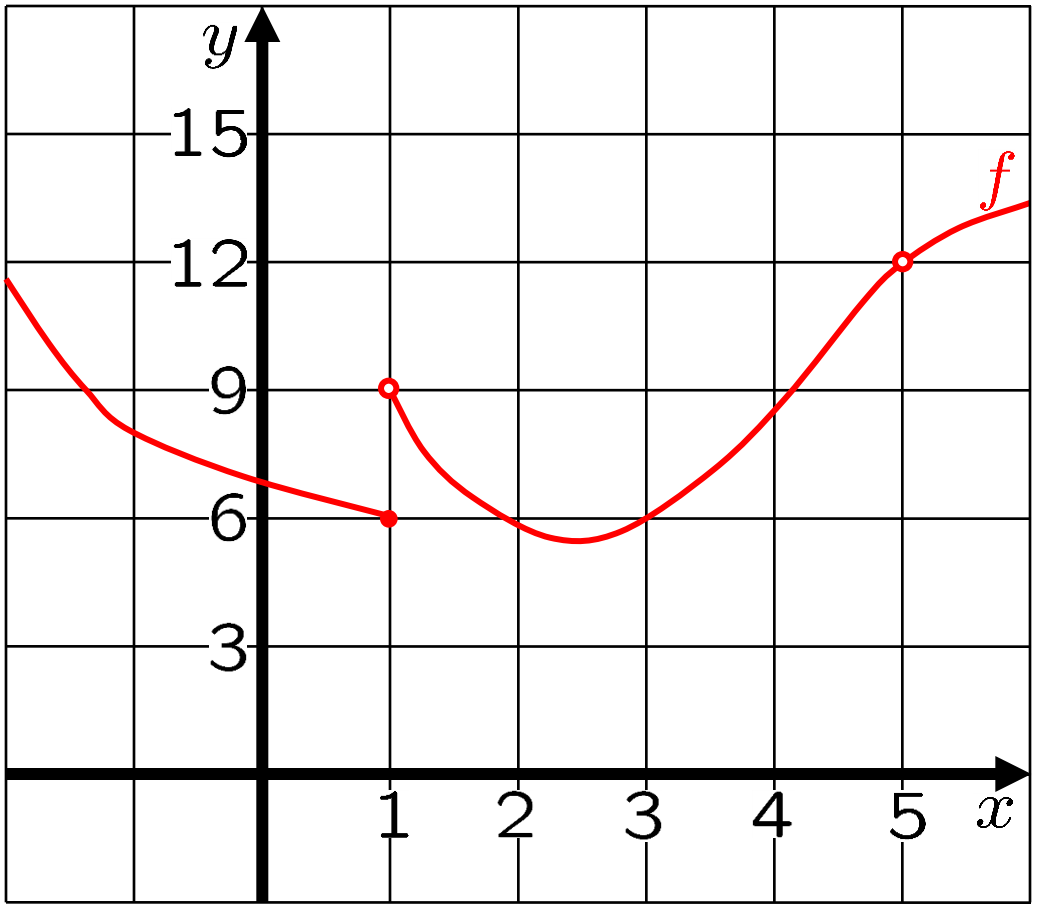
(a) $\lim_{x \to 1^-} f(x)$

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

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

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

(e) $f(5)$



OLD

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

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

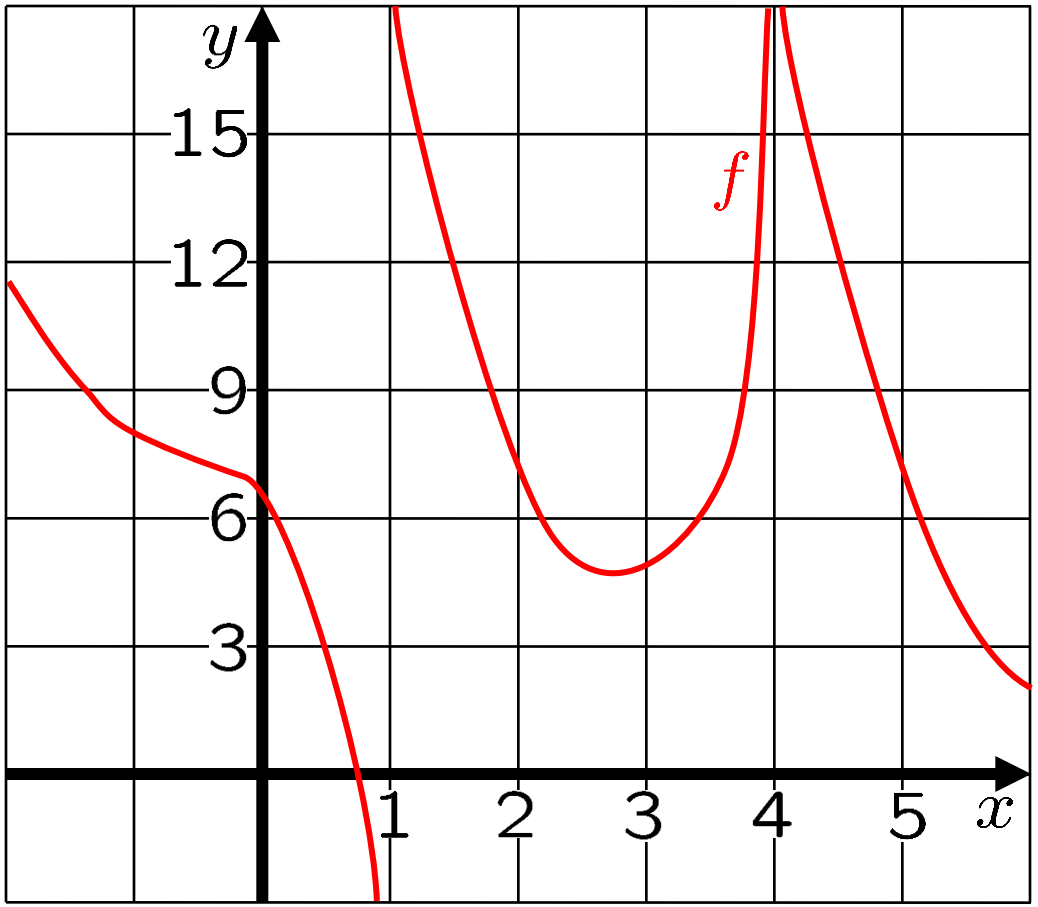
(b) $\lim_{x \to 1^+} f(x)$

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

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

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

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



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

OLD

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

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

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

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

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

OLD

or explain why the limit does not exist.

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

or explain why the limit does not exist.

c. Compute $\lim_{x \to 1} \dfrac{2x+3}{x-1}$,

or explain why the limit does not exist.

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

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

$$\lim_{\triangle x \to 0} \frac{(5+\triangle x)^3 - 5^3}{\triangle x}$$

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

the limit game

LOOK AHEAD

differentiate polynomials
differentiate all 6 trig functions
product rule, quotient rule

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

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

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

LOOK AHEAD

derivative of e^x, $\exp' = \exp$

product, quotient, chain rules

SAVE THE SESSION DATA

RETURN TO PRESENTATION