

1. If $|4 - x^2| \leq 5$ then

A. $-1 \leq x \leq 3$

B. $-3 \leq x$

C. $0 \leq x \leq 3$

D. $1 \leq x \leq 3$

E. $-3 \leq x \leq 3$

2. An equation for the line through the point $(3, 6)$ parallel to the line with equation $2x + y = 1$ is

A. $y + x = 9$

B. $2y - x = 9$

C. $y + 2x = 12$

D. $2y + x = 15$

E. $y - 2x = 0$

3. $\cot(\sin^{-1} x) =$

A. $\sqrt{1 - x^2}$

B. $\frac{x}{\sqrt{1 - x^2}}$

C. $x\sqrt{1 - x^2}$

D. $\frac{\sqrt{1 - x^2}}{x}$

E. $1 - x^2$

4. The graph of $y = e^x$ is reflected about the y axis and then reflected about the line $y = 1$. The resulting graph is the graph of $y =$

- A. e^{1-x}
- B. $2 - e^x$
- C. $1 - e^{-x}$
- D. $2 - e^{-x}$
- E. $1 - e^x$

5. A radioactive isotope has a half-life of 12 days. Initially there are 7 grams of the isotope. After t days how much of the isotope remains?

- A. $7 \cdot 2^{t/12}$
- B. $12 \cdot 2^{t/7}$
- C. $12 \cdot t^{-t/7}$
- D. $7 \cdot 2^{-t/12}$
- E. $7 \cdot 2^{-12t}$

6. If $\ln x - \ln(x - 1) = 1$ then $x =$

- A. 0
- B. 1
- C. $\frac{e}{e-1}$
- D. $1 - e$
- E. $1 - \frac{1}{e}$

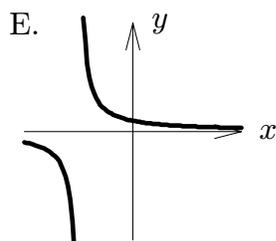
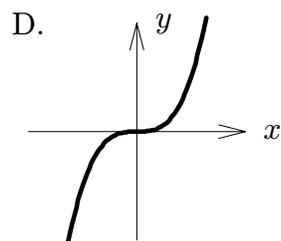
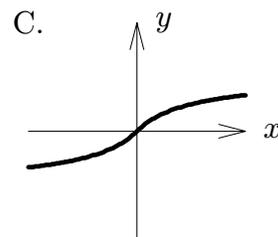
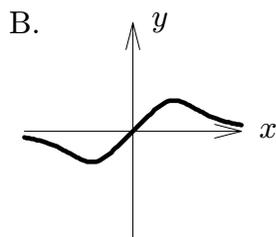
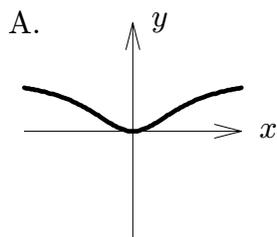
7. $\lim_{t \rightarrow 0} \frac{\sqrt{3+t} - \sqrt{3}}{t} =$

- A. 0
- B. $\frac{1}{2\sqrt{3}}$
- C. $\frac{1}{\sqrt{3}}$
- D. $\sqrt{3}$
- E. ∞

8. $\lim_{x \rightarrow 2^-} \frac{x^2 - 4}{|x - 2|} =$

- A. -4
- B. -2
- C. 0
- D. 2
- E. 4

9. The graph of $\frac{x}{1+x^4}$ looks most like



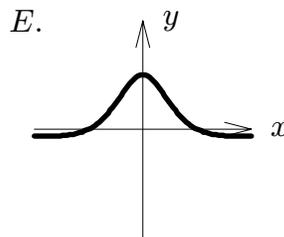
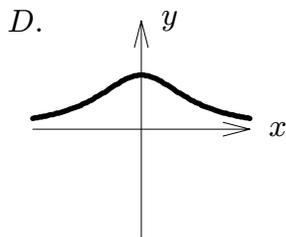
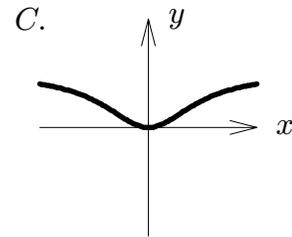
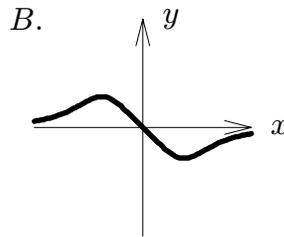
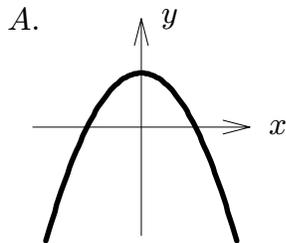
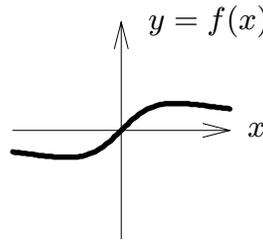
10. Find all the values of c so that the function

$$f(x) = \begin{cases} c^2 - x^2 & \text{if } x < 2 \\ 2(c + x) & \text{if } x \geq 2 \end{cases}$$

is continuous on all of $(-\infty, \infty)$.

- A. $-4, -2$
- B. $-2, 4$
- C. 2
- D. -2
- E. $2, 0$

11. Which could be the graph of $y = f'(x)$ if $y = f(x)$ has graph



12. If $f(x) = 1 - \frac{2}{x}$ then $f'(x) =$

- A. $\frac{2}{x^2}$
- B. $\frac{1}{x}$
- C. $\frac{1}{2x}$
- D. $1 + \frac{1}{x}$
- E. $1 + \frac{2}{x^2}$

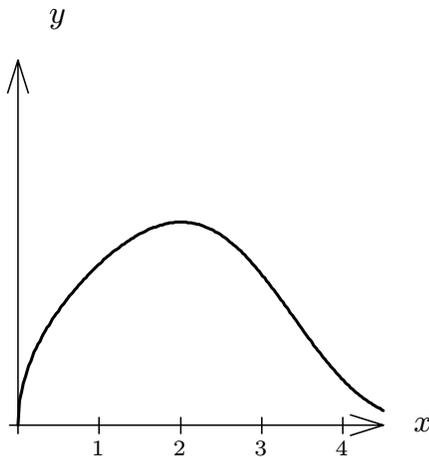
13. Given the following information

$$f(0) = 4, f(1) = 2, f'(0) = 0, f'(1) = 3, f'(2) = 5, f'(4) = 7,$$

an equation of the tangent line to the curve $y = f(x)$ at $(1, 2)$ is

- A. $y - 2 = 3(x - 1)$
- B. $y - 2 = 5(x - 1)$
- C. $y - 1 = 7x$
- D. $y - 4 = 7(x - 2)$
- E. cannot be determined
from the information given

14. Given the graph of $y = f(x)$ arrange $f'(1)$, $f'(2)$ and $f'(3)$ in increasing size



- A. $f'(1), f'(2), f'(3)$
- B. $f'(2), f'(3), f'(1)$
- C. $f'(2), f'(1), f'(3)$
- D. $f'(1), f'(3), f'(2)$
- E. $f'(3), f'(2), f'(1)$