

1. **TRUE or FALSE?** If $y = \pi^3$ then $y' = 3\pi^2$
- (a) **FALSE**
(b) **TRUE**
2. (*) What is the derivative of $\ln((3x + 2)^2)$?
- (a) $2\frac{d}{dx}\ln(3x + 2)$
(b) $\frac{6}{(3x+2)}$
(c) $\frac{2}{(3x+2)}$
(d) $\frac{3}{(3x+2)^2}$
3. (*) Which is true for the function $f(x) = \frac{x}{x+1}$, defined on the domain $x \geq 0$?
- (a) f is monotone increasing
(b) there is an x in the domain of f such that $f(x) = 1/2$
(c) there is an x in the domain of f such that $f(x) = 1$.
(d) f is monotone decreasing
4. Which describes the tangent line to the graph of $f(x) = x^3 - 5x$ at the point $(2, f(2))$?
- (a) $y = (3x^2 - 5)(x - 2) - 2$
(b) $y = 7x - 16$
(c) $y = 7x - 14$
(d) $y = 3x^2 - 5$
5. (*) Suppose that $f(x)$ is a differentiable function defined for all real x and for which $f(0) = 0$ and $f'(0) = 1$. Then regarding the value $f(x)$ at $x = 1$ we know that :
- (a) $-2 < f(1) < 2$.
(b) nothing
(c) $f(1) > 0$
(d) $f(1) = 1$
6. **TRUE or FALSE?** There is an exponential function $f(x) = Ae^{kx}$, with A, k real constants, such that $f(0) = -1$ and $f(2) = e^2$.
- (a) **FALSE**
(b) **TRUE**
7. **TRUE or FALSE?** There is a quadratic polynomial $p(x)$ for which $p(-2) = p(3) = 0$, $p'(-2) > 0$, and $p'(3) > 0$
- (a) **TRUE**
(b) **FALSE**
8. If $P(t) = (5)2^t$ then which of the following numbers represents $P(8)/P(6)$?
- (a) 2
(b) 4
(c) 8
(d) 25

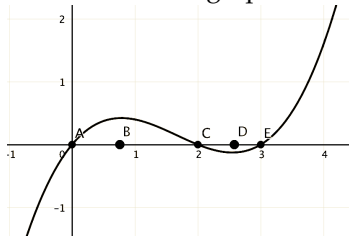
9. TRUE or FALSE? If $y = (e^x)^2$ then $y' = 2y$.

- (a) FALSE
- (b) TRUE

10. If $P(t) = 2^t$ then which of the represents dP/dt ?

- (a) $t2^{t-1}$
- (b) $\log_e(2)2^t$
- (c) $(e/2)e^t$
- (d) 2^t

11. Here is the graph of a function. On what region is its derivative negative?

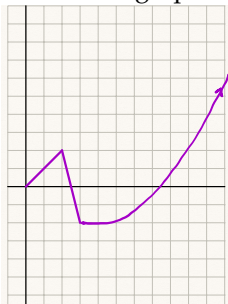


- (a) (B, D)
- (b) $(-\infty, A) \cup (C, \infty)$
- (c) (A, E)
- (d) $(-\infty, A) \cup (C, E)$

12. Given that $10^3 = 1,000$, which of the following represents the 1st order approximation to $(1008)^{1/3}$?

- (a) 10.026593
- (b) $10 + 8/300$
- (c) $10 + 8/3$
- (d) $10+2$

13. Here is the graph of a function.



Which of the following represents the graph of its derivative?

- (a)
- (b)
- (c)
- (d)

This page intentionally left blank.