Name _____   Date _____

1. Find an equation for the tangent line to the graph of $f(x) = \sqrt{x+1}$ at the point where $x = 3$.

    a) $x - 4y = -5$ b) $4x - y = 5$

    c) $x + 4y = 8$ d) $x - 4y = 5$

    e) $4x - y = -8$

2. Find an equation for the tangent line to the graph of $f(x) = \sqrt{x-7}$ at the point where $x = 16$.

    a) $x - 6y = -2$ b) $6x - y = 2$

    c) $x + 6y = 2$ d) $x - 6y = 2$

    e) $6x + y = -2$

3. If $f(x) = -x^2 + 12$, find an equation of the tangent to the curve passing through the point $(4, 0)$.

    a) $y = -8x + 32$ b) $y = -8x - 32$

    c) $y = -4x$ d) $y = -4x + 16$

    e) $y = -2x - 32$

4. If $f(x) = x^2 - 10$, find an equation of the tangent to the curve passing through the point $(5, 1)$.

    a) $y - 1 = -10(x - 5)$ b) $y + 5 = -10(x + 1)$

    c) $y + 1 = 10(x + 5)$ d) $y - 1 = 10(x - 5)$

    e) $y - 5 = 10(x - 1)$

5. Find the slope of the tangent line to the graph of $f(x) = 2x(2x^2 - 1)$ at the point where $x = 1$.

    a) $\dfrac{\sqrt{6}}{6}$ b) 2   c) $\sqrt{2}$ d) 10   e) 12

6. Find the slope of the tangent line to the graph of $f(x) = -3x^2(x^2 + 2)$ at the point where $x = -1$.

    a) 6   b) -6 c) 0   d) 24   e) -24

7. Given a function is defined by $f(x) = \sqrt{x+4}$, for what value(s) of x does the function have one or more vertical tangents?

    a) 0 only   b) 4 only   c) -4 only

    d) 0 and 4   e) 0 and -4

8. Write the equation of the tangent line to the graph of $f(x) = x^4 - 7x^2 + 12$ at the point where $x = 1$.

    a) $10x + 2y - 5 = 0$ b) $10x + y - 16 = 0$

    c) $5x + y - 8 = 0$ d) $x + 10y - 16 = 0$

    e) $2x + 10y - 16 = 0$

9. Let $f(x) = \begin{cases} x^2 + 3x - 5 & \text{for } x \leq 1, \\ 5x - 6 & \text{for } x > 1 \end{cases}$

    Does the curve have a tangent at $x = 1$?

10. Given: $f(x) = \begin{cases} x^2 + 5x - 3 & \text{for } x \leq 0, \\ 2x - 3 & \text{for } x > 0 \end{cases}$

    Does the curve have a tangent at $x = 0$?

11. For what x-values is the slope of $f(x) = 2x^4 + x^3 - 7x^2 + 4x - 3$ equal to 2?

1.
Answer: a
CodePath: APC.EC.3

2.
Answer: a
CodePath: APC.EC.4

3.
Answer: d
CodePath: APC.EC.5

4.
Answer: d
CodePath: APC.EC.6

5.
Answer: d
CodePath: APC.EC.7

6.
Answer: d
CodePath: APC.EC.8

7.
Answer: c
CodePath: APC.EC.29

8.
Answer: b
CodePath: APC.EC.39

9.
Answer: yes, $m = 5$
CodePath: APC.EC.65

10.
Answer: no, slopes are different
CodePath: APC.EC.67

11.
Answer: $-1.581, 0.150, 1.057$
CodePath: APC.EC.71