Answer key

The method: Tangent lines

The slope is $f'(a)$ and the point is $(a, f(a))$. Write $y - f(a) = f'(a)(x - a)$, then solve for y.

$f(x) = x^3 - 6x + 4$ at $x = -2$ → $y = 6x + 20$

$f(-2) = (-2)^3 - 6(-2) + 4 = 8$ the point

$f'(x) = 3x^2 - 6$

$f'(-2) = 3(-2)^2 - 6 = 6$ the slope

$y - 8 = 6(x + 2)$ point-slope form

$y = 6x + 20$

$f(x) = 2x^2 + x - 7$ at $x = 3$ → $y = 13x - 25$

$f(3) = 2(3)^2 + (3) - 7 = 14$ the point

$f'(x) = 4x + 1$

$f'(3) = 4(3) + 1 = 13$ the slope

$y - 14 = 13(x - 3)$ point-slope form

$y = 13x - 25$

Problems 1 and 2 worked out · Version 0A

$f(x) = 2x^2 - 2$ at $x = 1$ → $y = 4x - 4$

$f(1) = 2(1)^2 - 2 = 0$ the point

$f'(x) = 4x$

$f'(1) = 4(1) = 4$ the slope

$y - 0 = 4(x - 1)$ point-slope form

$y = 4x - 4$

$f(x) = 2x^3 - 3x - 1$ at $x = 3$ → $y = 51x - 109$

$f(3) = 2(3)^3 - 3(3) - 1 = 44$ the point

$f'(x) = 6x^2 - 3$

$f'(3) = 6(3)^2 - 3 = 51$ the slope

$y - 44 = 51(x - 3)$ point-slope form

$y = 51x - 109$

Tangent lines · Version 0A

1) $y = 4x - 4$ 2) $y = 51x - 109$ 3) $y = -4x - 4$
4) $y = -x + 11$ 5) $y = -9x - 3$ 6) $y = -8x - 6$
7) $y = 8x + 4$ 8) $y = 7x - 13$ 9) $y = 5x - 4$