Solve:

1) Find the equation of the tangent line to the graph of $b(x) = -5x^2 + 3x - 2$ at $x = -1$.

$b'(x) = -10x + 3$ $(-1, -10)$

$b'(-1) = 13$

$-10 = 13(-1) + b$

$b = 3$

$y = 13x + 3$

2) Find the equation of the tangent line to the graph of $c(x) = -5$ at $x = 1$.

$(1, -5)$

$c'(x) = 0$

$-5 = 1 \cdot 0 + b$

$b = -5$

$y = -5$

3) What is the equation of the tangent line at $x = 0$ assuming that $w(0) = -1$ and $w'(0) = 2$?

$(0, -1)$ $m = 2$

$-1 = 2 \cdot 0 + b$

$b = -1$

$y = 2x - 1$

4) Find the equation of the tangent line to the graph of $g(x) = 2x^2 - 4x - 2$ at $x = 2$.

$g'(x) = 4x - 4$ $(2, -2)$

$g'(2) = 4$

$-2 = 4 \cdot 2 + b$

$b = -10$

$y = 4x - 10$

5) Find the equation of the *normal* line to the graph of $s(x) = -4x - 1$ at $x = 0$.

$s'(x) = -4$

$m = \frac{1}{4}$ $(0, -1)$

$-1 = \frac{1}{4} \cdot 0 + b$

$b = -1$

$y = \frac{1}{4}x - 1$

6) What is the equation of the tangent line at $x = -2$ assuming that $s(-2) = 5$ and $s'(-2) = -1$?

$(-2, 5)$ $m = -1$

$5 = -1(-2) + b$

$b = 3$

$y = -x + 3$

7) Find the equation of the tangent line to the graph of $r(x) = -4x^4 - 4x^3 - 5x^2 - 3x - 1$ at $x = -2$.

$r'(x) = -16x^3 - 12x^2 - 10x - 3$

$r'(-2) = 97$ $(-2, -47)$

$-47 = -2 \cdot 97 + b$

$b = 147$

$y = 97x + 147$

8) Find the equation of the tangent line to the graph of $m(x) = 2$ at $x = -2$.

$m'(x) = 0$ $(-2, 2)$

$2 = 0 \cdot -2 + b$

$b = 2$

$y = 2$

9) What is the equation of the *normal* line at $x = 2$ assuming that $n(2) = -1$ and $n'(2) = -4$?

$(2, -1)$ $m = \frac{1}{4}$

$-1 = \frac{1}{4} \cdot 2 + b$

$b = -\frac{3}{2}$

$y = \frac{1}{4}x - \frac{3}{2}$

10) Find the equation of the tangent line to the graph of $u(x) = 2x^3 - 3x^2 - 2x - 4$ at $x = -2$.

$u'(x) = 6x^2 - 6x - 2$

$u'(-2) = 34$ $(-2, -28)$

$-28 = 34(-2) + b$

$b = 40$

$y = 34x + 40$