Special Points - Answer Key

1. Find the critical points of $f(x) = 4x+7$.

    None.

2. Find the critical point of $g(x) = 4x + \frac{1}{x}$.

    $x = \pm\frac{1}{2}$

3. Find inflection point of $u(x) = x^2 \ln(x)$.

    $x = e^{-3/2}$

4. Find inflections point(s) of $f(x)$ where $f''(x) = \ln(x^2 + x - 11)$.

    $x = 3, -4$

5. Find critical point(s) of $f(x) = x2^{x^2-16x}$.

    $x = \frac{16\ln(2)-1}{2\ln(2)}$

6. Find inflection point(s) of $g(x)$ where $g'(x) = \sin(e^{x^2})$.

    $x = 0, \sqrt{\ln\left(\frac{n\pi}{4}\right)}$, n is odd.

7. Find critical point(s) of $h(y)$ where $h'(y) = 7y^2 - 28$.

    $y = \pm 4$

8. Find the inflection point(s) of $f(x)$ where $\frac{df}{dx} = x(b - x)$.

    $x = \frac{b}{2}$

9. If θ^* is an inflection point of $w(\theta) = e^{-a\theta}\cos(b\theta)$, where $a \neq b$, find the equation satisfied by θ^*.

    $\tan(b\theta^*) = \frac{a(b+a)}{b(b-a)}$

10. Find critical point(s) of $h(x)$ where $h''(x) = 5$ and $h'(0) = 10$.

    $h'(x) = 5x + h(0)$, the crtitical point is $x = -2$.