

# Solutions

**No Work = No Credit. Write Legibly. Box your final result.**

1. 10 points Find the absolute maximum and absolute minimum values of  $f$  on the given interval.

$$f(x) = x^4 - 2x^2 + 3, \quad [-2, 3] \quad (1)$$

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First we find all critical points of (1), i.e.,  $f'(x) = 0$  yields,

$$f'(x) = 4x^3 - 4x$$

$$x(4x^2 - 4) = 0. \quad (2)$$

Solving (2) for  $x$  yields  $x = 0$ ,  $x = \pm 1$ . To find where  $f(x)$  has absolute maximum or absolute minimum, we evaluate  $f(x)$  at critical points and at the end points of the interval, to obtain

$$f(0) = 3$$

$$\boxed{f(\pm 1) = 2, \quad \text{Absolute Minimum}}$$

$$f(-2) = 11$$

$$\boxed{f(3) = 66, \quad \text{Absolute Maximum.}}$$