

**Derivative Applications****Critical & Extreme Points****Extreme: First Derivative Test**

1. *first derivative test*  $4 - x^2$

2. *first derivative test*  $x^2 - 2x - 3$

3. *first derivative test*  $x^3 - 3x + 1$

4. *first derivative test*  $x^2 - 6x + 8$

5. *first derivative test*  $x^3 - 3x$

6. *first derivative test*  $(x + 5)^2$

7. *first derivative test*  $\frac{1}{x^2} + \frac{1}{x}$

8. *first derivative test*  $\frac{2x^2 + 6}{x}$

9. *first derivative test*  $\frac{1}{9 + x^2}$

10. *first derivative test*  $\frac{3}{x^3 - 1}$

**Answers****Derivative Applications****Critical & Extreme Points****Extreme: First Derivative Test**

1. Maximum  $(0, 4)$
2. Minimum  $(1, -4)$
3. Maximum  $(-1, 3)$ , Minimum  $(1, -1)$
4. Minimum  $(3, -1)$
5. Maximum  $(-1, 2)$ , Minimum  $(1, -2)$
6. Minimum  $(-5, 0)$
7. Minimum  $\left(-2, -\frac{1}{4}\right)$
8. Maximum  $(-\sqrt{3}, -4\sqrt{3})$ , Minimum  $(\sqrt{3}, 4\sqrt{3})$
9. Maximum  $\left(0, \frac{1}{9}\right)$
10. Saddle  $(0, -3)$