

Even Answers 4.3

2) a) Zero: $x \approx 0, \pm 1.25$

positive: $(-1.25, 0)$ and $(1.25, \infty)$

negative: $(-\infty, -1.25)$ and $(0, 1.25)$

b) Zero: $x \approx \pm 0.7$

positive: $(-\infty, -0.7)$ and $(0.7, \infty)$

negative: $(-0.7, 0.7)$

4) a) $[-2, 2]$

b) $(-\infty, -2]$ and $[2, \infty)$

c) Local max at $x=2$

Local min at $x=-2$

8) Decreasing: $x < 0, x > 2$

Increasing: $0 < x < 2$

Concave up: $x < 1$

Concave down: $x > 1$

Local max at $(2, 5)$

Local min at $(0, -3)$

pt. of inflection at $(1, 1)$

10) Increasing: $x < 0, x > 1$

Decreasing: $0 < x < 1$

Concave up: $x > 0$

Concave down: $x < 0$

Local min at $(1, e)$

12) Increasing: $x < 0$

Decreasing: $x > 0$

Concave up: $x > 0$

Concave down: $x < 0$

Local min: $(0, 1)$

No inflection point

30) a) Local max at $x=2$

b) Local min at $x=4$

c) Points of inflection at

$x=1, x \approx 1.63, x \approx 3.37$

38) a) $v(t) = -2 - 2t$

b) $a(t) = -2$

c) It begins at position 6 ($s(0) = 6$) and moves in the negative direction thereafter

40) a) $v(t) = 6t - 6t^2$

b) $a(t) = 6 - 12t$

c) It begins at position 0 ($s(0) = 0$) and starts moving in the positive direction until it reaches 1 at $t = 1$ ($s(1) = 1$). It moves in the negative direction thereafter.

42) a) The velocity is 0 (when the tangent line is horizontal) at $t \approx 4$, $t \approx 12$

b) The acceleration is 0 (at the inflection points) at $t \approx 1.5$, $t \approx 5.2$, $t \approx 8$, $t \approx 11$ and $t \approx 13$