# Descartes' Rule of Signs Worksheet - Answer Key

All 18 problems checked for sign changes, positive/negative possibilities, and root profiles.

## Level 1

| # | V+ / Positive | V- / Negative | Nonreal / profiles |
|---|---|---|---|
| 1 | 4 -> 4, 2, 0 | 0 -> 0 | Use degree to finish nonreal count if asked. |
| 2 | 2 -> 2, 0 | 3 -> 3, 1 | Use degree to finish nonreal count if asked. |
| 3 | 3 -> 3, 1 | 2 -> 2, 0 | Use degree to finish nonreal count if asked. |
| 4 | 2 -> 2, 0 | 2 -> 2, 0 | Use degree to finish nonreal count if asked. |
| 5 | 2 -> 2, 0 | 2 -> 2, 0 | Use degree to finish nonreal count if asked. |
| 6 | 0 -> 0 | 4 -> 4, 2, 0 | Use degree to finish nonreal count if asked. |

## Level 2

| # | V+ / Positive | V- / Negative | Nonreal / profiles |
|---|---|---|---|
| 7 | 3 -> 3, 1 | 2 -> 2, 0 | Possible nonreal: 0, 2, 4 |
| 8 | 4 -> 4, 2, 0 | 1 -> 1 | Possible nonreal: 0, 2, 4 |
| 9 | 2 -> 2, 0 | 2 -> 2, 0 | Possible nonreal: 0, 2, 4 |
| 10 | 3 -> 3, 1 | 1 -> 1 | Possible nonreal: 0, 2 |
| 11 | 6 -> 6, 4, 2, 0 | 0 -> 0 | Possible nonreal: 0, 2, 4, 6 |
| 12 | 2 -> 2, 0 | 3 -> 3, 1 | Possible nonreal: 0, 2, 4 |

## Level 3

| # | V+ / Positive | V- / Negative | Nonreal / profiles |
|---|---|---|---|
| 13 | 4 -> 4, 2, 0 | 0 -> 0 | (positive 4, negative 0, nonreal 0); (positive 2, negative 0, nonreal 2); (positive 0, negative 0, nonreal 4) |
| 14 | 3 -> 3, 1 | 2 -> 2, 0 | (positive 3, negative 2, nonreal 0); (positive 3, negative 0, nonreal 2); (positive 1, negative 2, nonreal 2); (positive 1, negative 0, nonreal 4) |
| 15 | 4 -> 4, 2, 0 | 2 -> 2, 0 | (positive 4, negative 2, nonreal 0); (positive 4, negative 0, nonreal 2); (positive 2, negative 2, nonreal 2); (positive 2, negative 0, nonreal 4); (positive 0, negative 2, nonreal 4); (positive 0, negative 0, nonreal 6) |
| 16 | 4 -> 4, 2, 0 | 1 -> 1 | (positive 4, negative 1, nonreal 0); (positive 2, negative 1, nonreal 2); (positive 0, negative 1, nonreal 4) |
| 17 | 5 -> 5, 3, 1 | 2 -> 2, 0 | (positive 5, negative 2, nonreal 0); (positive 5, negative 0, nonreal 2); (positive 3, negative 2, nonreal 2); (positive 3, negative 0, nonreal 4); (positive 1, negative 2, nonreal 4); (positive 1, negative 0, nonreal 6) |
| 18 | 4 -> 4, 2, 0 | 1 -> 1 | Factor $x^2$ first. (positive 4, negative 1, nonreal 0, zero 2); (positive 2, negative 1, nonreal 2, zero 2); (positive 0, negative 1, nonreal 4, zero 2) |