2022 MIT Science Bowl High School Invitational Tiebreak Round 2

TOSSUP

1) CHEMISTRY *Multiple Choice* In the reaction of zinc with hydrochloric acid, which of the following best describes the role of zinc in the reaction?

W) Oxidant
X) Reductant
Y) Homogeneous (*home-uh-GEE-nee-us*) catalyst
Z) Heterogeneous (*he-tuh-roh-GEE-nee-us*) catalyst

ANSWER: X) Reductant

TOSS UP

2) EARTH AND SPACE *Short Answer* By name or number, identify all of the following three traits that are characteristic of good index fossils:

1) Geographically widespread
2) Broad time range
3) Relatively rare

ANSWER: 1 only

TOSS UP

3) PHYSICS *Short Answer* A 4 coulomb charge is moved through a potential difference of 2 volts. In joules, what is the change in the potential energy of this particle?

ANSWER: 8

TOSS UP

4) BIOLOGY *Short Answer* By name or number, identify all of the following three cellular components that are made primarily of microtubules:

1) Flagella
2) Mitotic spindle
3) Cilia

ANSWER: 1, 2, 3 (ACCEPT: All)

TOSS UP

5) MATH *Multiple Choice* At which of the following x-values is the curvature of the parabola $y = x^2 - 2x + 3$ the greatest?

W) -4
X) -2
Y) 2
Z) 4

ANSWER: Y) 2
