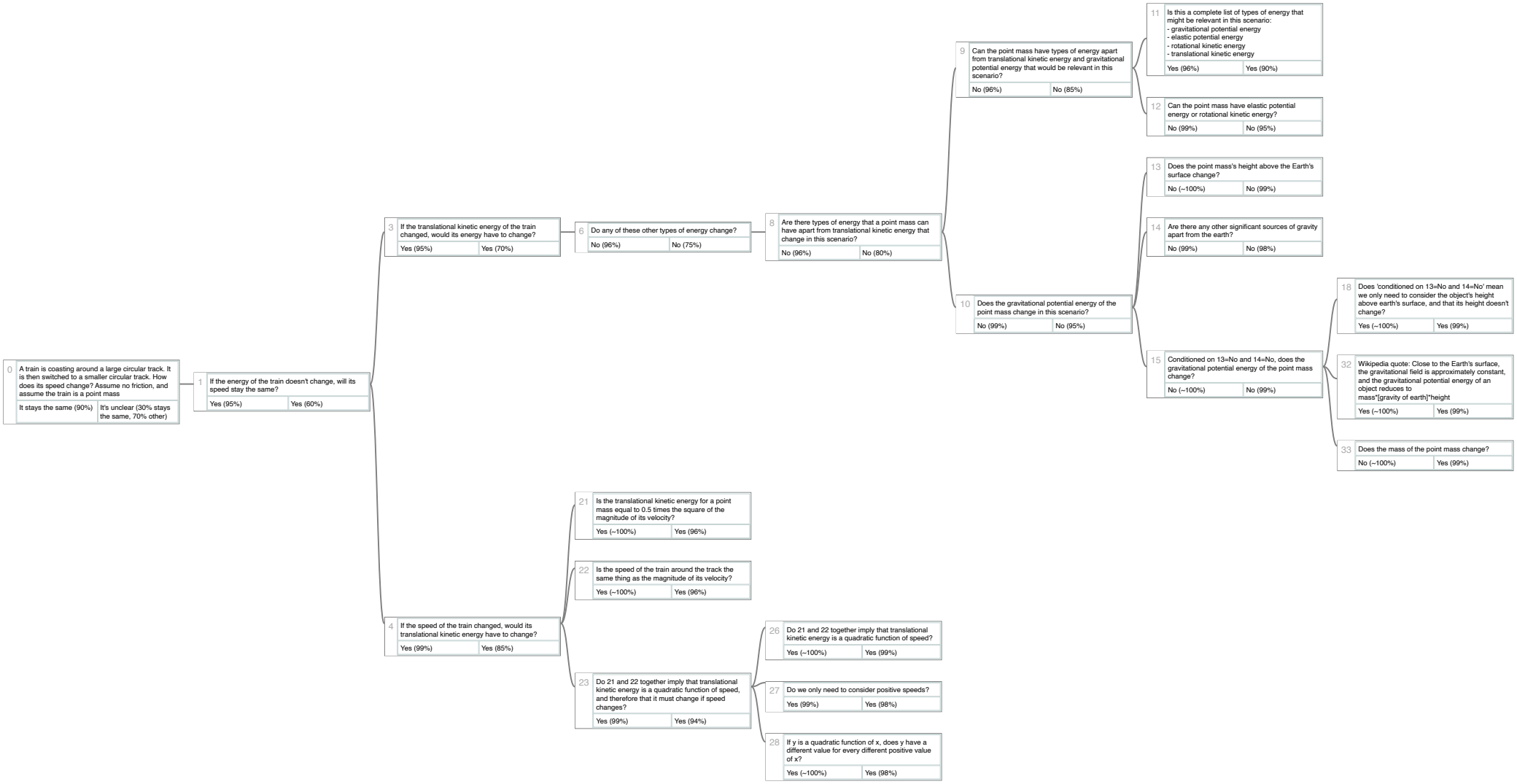
0
A train is coasting around a large circular track. It is then switched to a smaller circular track. How does its speed change? Assume no friction, and assume the train is a point mass
It stays the same (90%)
It's unclear (30% stays the same, 70% other)
1
If the energy of the train doesn't change, will its speed stay the same?
Yes (95%)
Yes (60%)
3
If the translational kinetic energy of the train changed, would its energy have to change?
Yes (95%)
Yes (70%)
6
Do any of these other types of energy change?
No (96%)
No (75%)
8
Are there types of energy that a point mass can have apart from translational kinetic energy that change in this scenario?
No (96%)
No (80%)
9
Can the point mass have types of energy apart from translational kinetic energy and gravitational potential energy that would be relevant in this scenario?
No (96%)
No (85%)
11
Is this a complete list of types of energy that might be relevant in this scenario:
- gravitational potential energy
- elastic potential energy
- rotational kinetic energy
- translational kinetic energy
Yes (96%)
Yes (90%)
12
Can the point mass have elastic potential energy or rotational kinetic energy?
No (99%)
No (95%)
10
Does the gravitational potential energy of the point mass change in this scenario?
No (99%)
No (95%)
13
Does the point mass's height above the Earth's surface change?
No (~100%)
No (99%)
14
Are there any other significant sources of gravity apart from the earth?
No (99%)
No (98%)
15
Conditioned on 13=No and 14=No, does the gravitational potential energy of the point mass change?
No (~100%)
No (99%)
18
Does 'conditioned on 13=No and 14=No' mean we only need to consider the object's height above earth's surface, and that its height doesn't change?
Yes (~100%)
Yes (99%)
32
Wikipedia quote: Close to the Earth's surface, the gravitational field is approximately constant, and the gravitational potential energy of an object reduces to
mass*[gravity of earth]*height
Yes (~100%)
Yes (99%)
33
Does the mass of the point mass change?
No (~100%)
Yes (99%)
4
If the speed of the train changed, would its translational kinetic energy have to change?
Yes (99%)
Yes (85%)
21
Is the translational kinetic energy for a point mass equal to 0.5 times the square of the magnitude of its velocity?
Yes (~100%)
Yes (96%)
22
Is the speed of the train around the track the same thing as the magnitude of its velocity?
Yes (~100%)
Yes (96%)
23
Do 21 and 22 together imply that translational kinetic energy is a quadratic function of speed, and therefore that it must change if speed changes?
Yes (99%)
Yes (94%)
26
Do 21 and 22 together imply that translational kinetic energy is a quadratic function of speed?
Yes (~100%)
Yes (99%)
27
Do we only need to consider positive speeds?
Yes (99%)
Yes (98%)
28
If y is a quadratic function of x, does y have a different value for every different positive value of x?
Yes (~100%)
Yes (98%)