

LAB: ASTRONOMIC SCALES - SPEED, TIME, AND SPACE

Universal Constants:

Speed of light

Indicated by _____

1. _____
2. _____
3. _____

Portland to Boston: _____

Round trip: _____

Q 1 .How many round trips to Boston in 1 second travelling at “c”?

Solution:

answer:

Q 2 .How many round trips to Boston in **0.5 seconds** travelling at “c”

(0.5 sec: the time it takes an object on the surface of the Earth to **FREEFALL** (drop) _____^{*}

Solution:

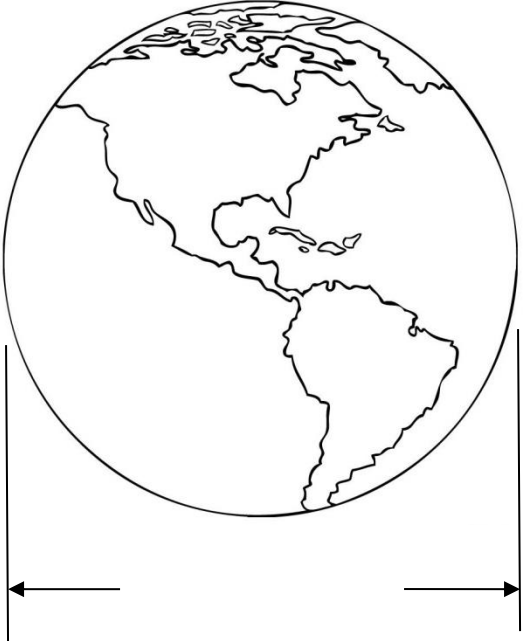
* One of Newton’s formulas: $t = \sqrt{\frac{s}{.5a}}$

t = time (in seconds), **s = distance** (in feet), and

a = acceleration of gravity (a_g) (in feet per second per second, or ft/sec²)

The acceleration of Earth’s gravity is 32 ft/sec²

answer:

| | |
|---|---|
|  | <p>Background info for Q 2 and Q 3: Rough estimate of Earth's circumference: Formula: Rounding for rough estimate:</p> <p>answer: <input type="text"/></p> |
|---|---|

Q 3. How many times around the world in **1 Sec** travelling at "c" ?

Solution:

answer:

Q 4. How many times around the world in **0.5 Sec** travelling at "c" ?

Solution:

answer:

Background for Q 5 and Q 6

Distance from Earth to the Moon:



Q 5. How long does it take light from the Moon to reach Earth?

Solution:

answer:

Q 6. How long does it take to reach the Moon travelling at 100 MPH 24/7?

Solution:

answer:

Distance from Earth to the Sun: _____
(_____)



Q 7 . How long does it take light from the Sun to reach the Earth?

Solution:

answer:

Q 8. Express the answer in meaningful terms:

Solution:

answer:

Q 9. How long would it take to reach the Sun travelling at average commercial jet speed (~ 500 MPH)

Express your answer in meaningful terms.

Solution:

answer:

Distance to nearest star: _____ / _____

“Light Year” : _____

Q 10: How many miles is **1 LY**?

Solution:

| |
|--|
| |
|--|