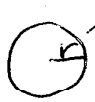
C.1 #1



$\longrightarrow$ 2r

Area =

$A = \pi r^2 \longrightarrow \pi(2r)^2$

$\pi 4r^2$

factor of 4

C.1 #2 (.645)

$P = \frac{V^2}{R}$ P = power, R = resistance, V = line voltage A & B same

B ⇒ R = .40 > e.g. B = 1.4, A = 1

~~$1.4R_B = R_A$~~

$R_B = 1.4R_A$

$P_B = .40 R_A$

$R_A = .40R_B + R_B$

$R_B = .40R_A + R_A = R_A(.4+1) = R_A(1.4) = \frac{R_B}{R_A}$

$\frac{P_B}{P_A} = \frac{V^2/R_B}{V^2/R_A} = \frac{V^2}{R_B} \cdot \frac{R_A}{V^2} = \frac{R_A}{R_B} = \frac{1}{1.4} = .714$

C.1 #3

a) 6.85×10^{-5} + $.027 \times 10^{-5}$ ⇒ 6.85×10^{-5} + $.027 \times 10^{-5}$

$6.877 \times 10^{-5} \rightarrow 6.88 \times 10^{-5}$

b) 2599.998 → 2600.00

c) 21.5 → 22

d) .01 e) .013

✓C.1 # 4 (224 m³)

record blue whale

$m = 1.9\times10^5\ kg \Rightarrow 1.9\times10^8\ g$

$\rho_{avg} = .85\ g/cm^3 = \frac{mass}{vol} = \frac{1.9\times10^8\ g}{vol}$

vol in m^3?

$\frac{.85\ g}{1\ cm^3} = \frac{1.9\times10^8\ g}{vol(m^3)}$

$= \frac{.85\ g}{8.5\times10^{-7}\ kg} = \frac{1.9\times10^8\ g}{vol\ m^3}$

$1\ cm^3 \rightarrow 1\times10^{-6}\ m^3$

$1.9\times10^8\ g\cdot cm^3 = .85\ g\cdot x$

$2.24\times10^8\ cm^3 = vol$ (↓ m^3)

$224\ m^3$

C.1 #5

Spring const $k = \frac{kg}{s^2} = \frac{62kg}{(.50)^2} = \frac{62kg}{.25^2} = \frac{248}{288}\ \frac{kg}{s^2}$

$\frac{62kg + \text{mass of chair } 10kg}{}$

$freq\ (f)^2 = \left(.50\ \frac{1}{s}\right)^2$

$m = 62\ kg$

$\frac{288\ kg}{s^2} = \frac{75kg}{f^2} = \frac{85kg}{f^2}$ (+10kg)

$f^2 = .2951$ (.302)

$f = .54\ \frac{1}{s}$

Name: Section #: Date:

Grade:

ASTRONOMY 1514-11
QUIZ # 7

1) Special relativity: 1 false.

a) Laws of physics are same in all reference systems moving uniformly with respect to each other
b) There are no preferred coordinate systems in nature
c) Speed of light depends on the speed of the observer

2) Moving at speeds close to speed of light: 1 false.

a) Moving clocks tick slower
b) Moving objects are less massive
c) Moving objects are shorter in the direction of motion

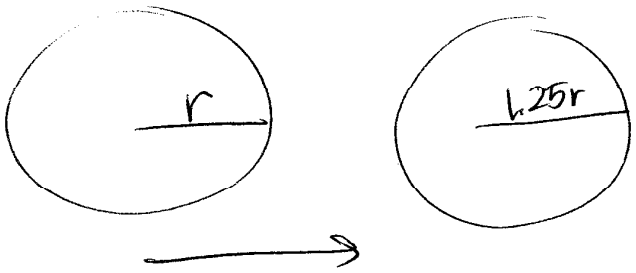
3) Hubble's law: 1 true.

a) The greater the distance to the object the slower it is moving
b) The greater the red-shift of the object the fastest it is moving away from us
c) Hubble's constant is a well established number

4) The Cosmological principle says that on large scales, universe is uniform and appears the same. T F

5) Light particles were formed before heavy particles. T F

C. 1 #. 6



r

$A = \pi r^2$

1.25r

$A = \pi (1.25r)^2$

$A = \pi 1.56 r^2$

56%

C.1 #7

~~5.0 cm~~ / min race = 26 miles

race in km?

$$26 \text{ miles} \times \frac{1609 \text{ m}}{1 \text{ mile}} \times \frac{.001 \text{ km}}{1 \text{ m}} = 41.83 \text{ km}$$

$$= \underline{42 \text{ km}}$$

C.1 #9

$W = Fd$ SI units of work?

$= [N \cdot m]$ $1N = kg \cdot \frac{m}{s^2}$

$= \left[kg \cdot \frac{m^2}{s^2}\right]$

C.1 #10

97°F @ 8:05am

101.0°F @ 12:05pm linear change

?	3:35 pm?

$$\frac{97°F}{101.0°F} = \frac{8:05am}{12:05pm}$$

4°F every 4 hrs

after 3.5 hrs?

$101 + 3.5°F = \underline{104.5°F}$

Name: Section #: Date:

Grade:

ASTRONOMY 1514-11
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C.1 # 8

1 furlong = 220 yds
1 fortnight = 14 days

$$\frac{1\ \text{furl}}{\text{fort}} \cdot \frac{220\ \text{yds}}{14\ \text{days}} \times \frac{.9144\ \text{m}}{1\ \text{yds}} \times \frac{10^{-6}\ \mu\text{m}}{1\ \text{m}}$$

a) $\frac{\mu\text{m}}{\text{s}} \times \frac{1\ \text{days}}{86400\ \text{s}}$

$$\frac{201.168 \times 10^{-6}}{1209600} = 1.66 \times 10^{-10} = 166\ \mu\text{m/s}$$

$$\frac{.201168}{1209600} = 1.7 \times 10^{-10}\ \text{km/s}$$

b) $\frac{220\ \text{yds}}{14\ \text{days}} \times \frac{.9144\ \text{m}}{1\ \text{yrd}} \times \frac{.0144\ \text{km}}{1\ \text{m}} = \frac{.014\ \text{km}}{1\ \text{day}}$ ← km/days

14000 km/day | .014 km/day = .0144 km/day