INTRODUCTION TO PHYSICS

Summer Packet, Physics
Prepared by Bergen Catholic High School

DIRECTIONS

Please complete the following problems. There are videos for each section to help you if you would like an additional review.

CONVERSIONS

Convert each number below into the equivalent unit. Write your answers in both Standard Form and Scientific Notation.

1) 5000 mg = _____ g in Standard Form and _____ g in Scientific Notation

2) 102 km = _____ m in Standard Form and _____ m in Scientific Notation

3) 590 cm = _____ m in Standard Form and _____ m in Scientific Notation

4) 1.9 kg = _____ g in Standard Form and _____ g in Scientific Notation

5) 9 mm = _____ cm in Standard Form and _____ cm in Scientific Notation

If you would like to review this topic, here is a great video on Khan Academy to watch: https://www.khanacademy.org/math/geometry-home/geometry-volume-surface-area/geometry-volume-rect-prism/v/conversion-between-metric-units

SIGNIFICANT DIGITS

Determine the number of Significant Digits in each example below.

1) 3928 _____

2) 96000 _____

3) 1090.0 _____

4) 3.2×10^3 _____

5) 800×10^{15} _____

If you would like to review this topic, here is a great video on Khan Academy to watch: https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/significant-figures

USING SIGNIFICANT FIGURES IN PROBLEMS

Express the answers to the following using the correct number of Significant figures.

1) 6009 + 58.232 + 0.2459 =

2) 200 x 3.58 =

3) 8692.1 – 34.78 – 6 =

4) 89 / 9.0 =

5) 6000 / 66 =

If you would like to review this topic, here is a great video on Khan Academy to watch: https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/addition-and-subtraction-with-significant-figures and https://www.khanacademy.org/math/arithmetic-home/arith-review-decimals/arithmetic-significant-figures-tutorial/v/multiplying-and-dividing-with-significant-figures

CONVERTING UNITS

Carry out the following conversions. Show your work.

1) *Convert 68 km to cm.*

2) *Convert 500 g to kg.*

3) *Convert 65 kg to mg.*

4) *Convert 430 m/s to m/h.*

5) *Convert the speed of light 3.0 x 108 m/s to km/day.*

If you would like to review this topic, here is a great video on Kahn Academy to watch: https://www.khanacademy.org/math/4th-engage-ny/engage-4th-module-2/4th-module-2-topic-b/v/metric-system-unit-conversion-examples

ALGEBRA REVIEW

Solve for d.

1) P = Fd/t

If you would like to review this topic, here is a great video on Khan Academy to watch: https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:modeling/x2ec2f6f830c9fb89:manipulating-formulas/v/rearrange-formulas-to-isolate-specific-variables

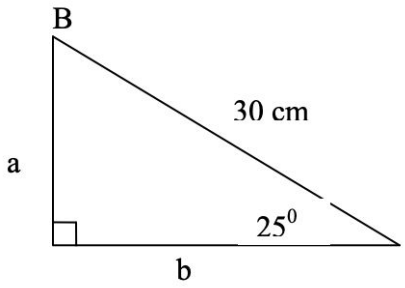
TRIGONOMETRY REVIEW

Solve for B, a and b.

1. B = _____

   a = _____ (use sin 25^o)

   b = _____ (use cos 25^o)



If you would like to review this topic, here is a great video on Khan Academy to watch: https://www.khanacademy.org/math/trigonometry/trigonometry-right-triangles/intro-to-the-pythagorean-identity/v/pythagorean-trig-identity-from-soh-cah-toa

Solving equations:

To solve an equation, first you should identify the unknown quantity for which you are trying to solve. Then isolate the variable with a coefficient of one by applying the correct property of equality to maintain equivalent expressions in each step of the process.
Watch these helpful videos:
https://www.youtube.com/watch?v=HrN6Qmb4cNc

https://www.youtube.com/watch?v=chmHzxfM3L0

Rearrange:
$d = vt + \frac{1}{2}at^2$
v =?
a=?

Solve:
$d = vt + \frac{1}{2}at^2$
If v = 3 m/s
If t = 2 s
If d = 20 m
Then a =?

Rearrange:
$v_f = v_i + at$
v_i=?
a=?
t=?

Solve:
$v_f = v_i + at$
If V_f= 20 m/s
If a= 5 m/s²
If v_i= 10 m/s
Then t=?

Rearrange:
$a = v^2/r$
v =?
r=?

Solve:
$a = v^2/r$
If a = 6 m/s²
If r= 20 m
Then v=?

- **Solve for the variable (V) in the given equation showing your steps: (Hint: follow order of operations PEMDAS).**

  1875*23 + 1025 *(-17) = (1875+1025) **V**

- **Solve for the variable (F) in the given equation showing your steps:**

  35 = **F*** (0.25) *(sin 60^0)