March 31 Gradekeeper Type Report

April 1 AM PT No School.

April 13 (Wed.) Report Cards

April 14 (Thur.) Evening PT

Physics 112

Wednesday, March 30/16

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1. Check -> Worksheet - Motion Problems
   Worksheet - Freely Falling Bodies

2. Assignment: U1-S3 -> Thursday, March 31/16

3. Test - Unit 1 -> Wednesday, April 6/16
   See the outline on the next two pages.

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4. Unit 2 - Dynamics
   - Section 1: Types of Forces and FBD's
   - Dynamics
   - Force, Net Force
   - Five Specific Forces

5. Worksheet - Practice Problems (PP) - C4 - Page 137: 1-4

Worksheet - Motion Problems

#12. 0.9 s

#13. 1.6×10^{-2} m

#14. 0.50 m/s

#15. 1.36 m/s^2 down the ramp

#16. 57 m/s

#17. 2.3×10^{5} m/s^2

#18. 0.15 m

Topics: Test Unit 1

1. kinematics
2. two types of physical quantities:
   (i) scalar quantity - has magnitude only
   - examples of scalar quantities
   (ii) vector quantity - has magnitude and direction
   - examples of vector quantities
   - know which directions are positive and which are negative by convention
3. arrows are used to represent vector quantities
4. definition of resultant
5. two methods used to add vector quantities:
   (i) tip-to-tail method
   (ii) parallelogram method
6. use rubric to determine a resultant graphically
7. use rubric to determine a resultant analytically
8. two types of frames of reference:
   (i) stationary/fixed
   (ii) moving
9. motion vocabulary and definitions
10. use signs of velocity and acceleration to describe an object's motion, etc
11. two types of motion
    (i) uniform
    (ii) uniformly accelerated motion

Topics: Test Unit 1 (Continued)

12. position-time graphs - interpret graphs
    - identify type of motion
    - slope = velocity
    - determine if/when an object changes direction
13. velocity-time graphs - interpret graphs
    - identify type of motion
    - slope = acceleration
    - area -> distance and displacement
    - be able to calculate average speed, average velocity and average acceleration
    - identify if/when an object changes direction
14. word problems - follow checklist to obtain full value
    - uniform motion - 1 formula
    - uniformly accelerated motion - 4 formulas
    - quadratic formula
15. acceleration due to gravity - influenced by mass of planet and distance from planet
    - symbol -> $\vec{g}$
    - on Earth $\vec{g} = -9.80\ m/s^2$
    - assuming no air resistance when working with freely falling bodies
    - interpret ball toss graphs

Science 122

Wednesday, March 30/16

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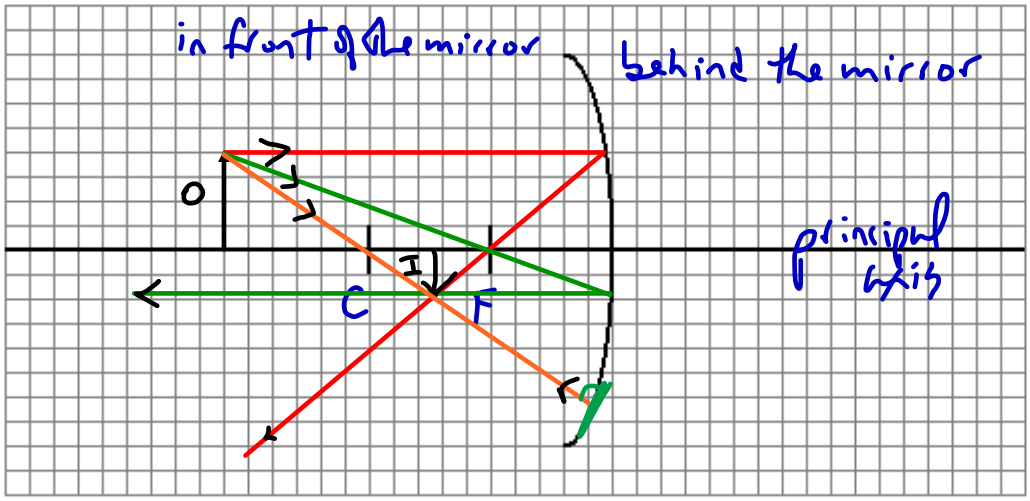
1. Worksheet: Concave Mirror - Ray Diagrams - HW
2. Convex Mirrors and Ray Diagrams - To Be Continued

3. Mirror Equation
4. Magnification Equation
5. Worksheet: Red Text - Spherical Mirrors
6. Lenses
7. Convex Lens
8. Images Formed by Convex Lenses
9. Worksheet: Convex Lens - Ray Diagrams
10. Concave Lenses and The Images They Form
11. Lens Equation, Magnification and Sign Conventions

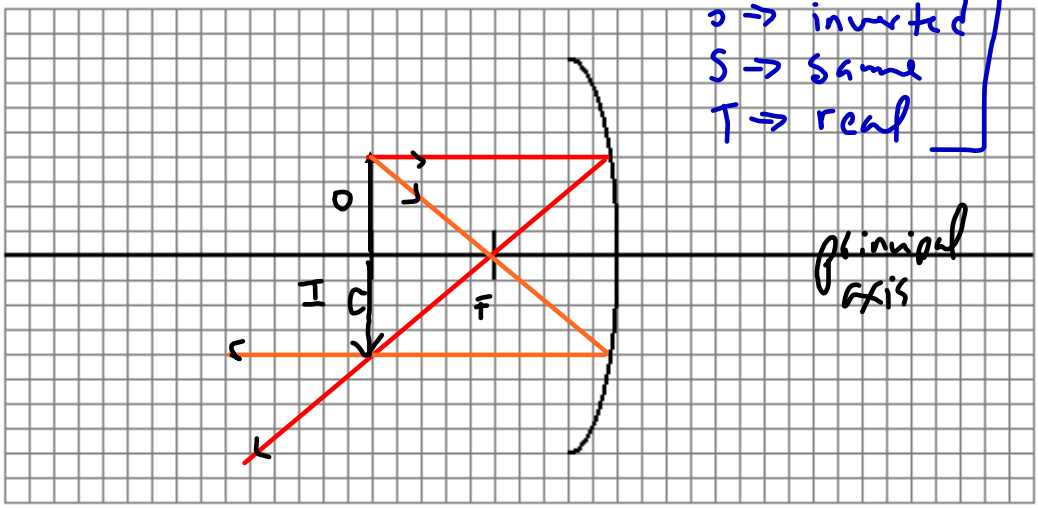
Concave Mirror - Ray Diagrams

INCLUDE POST

1. Object Beyond C

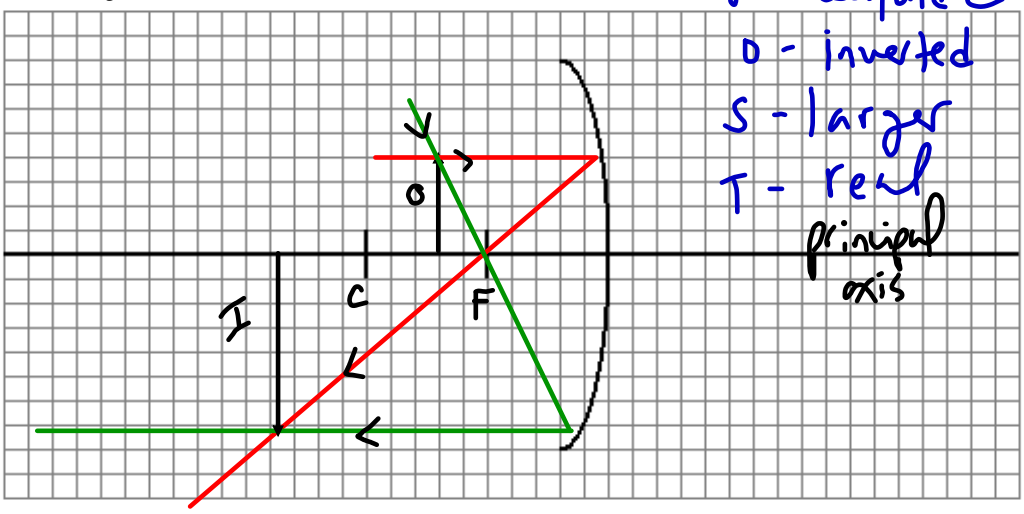


2. Object At C



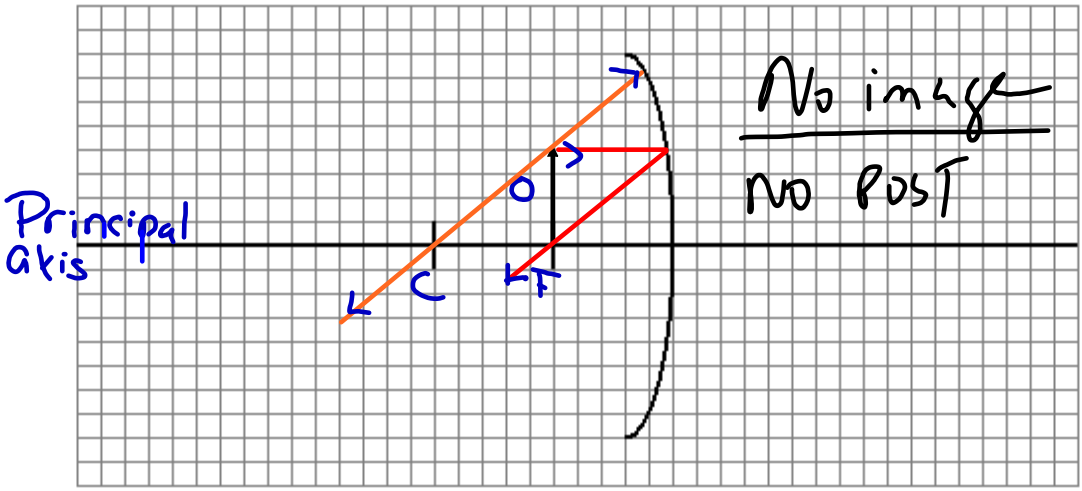
P -> At C
O -> inverted
S -> same
T -> real

3. Object Between C and F

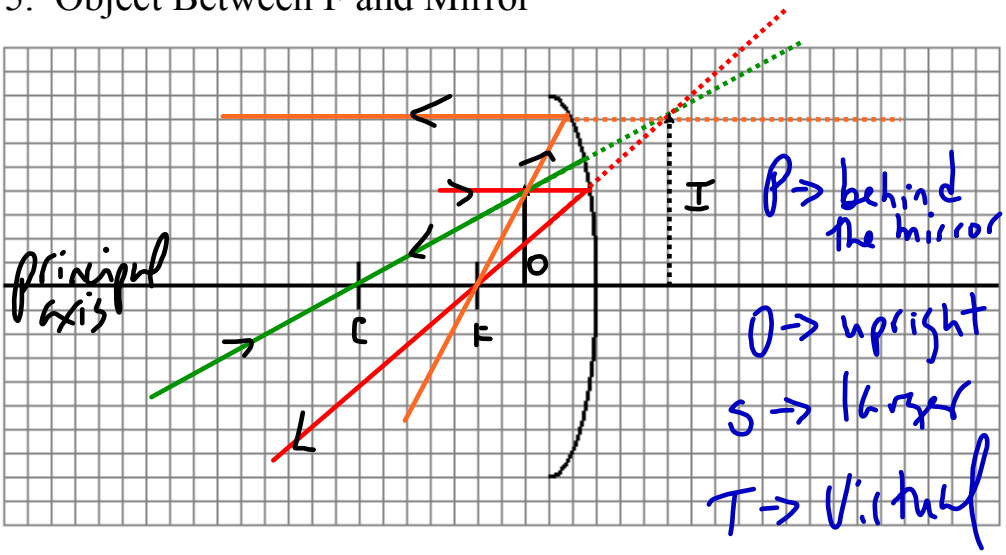


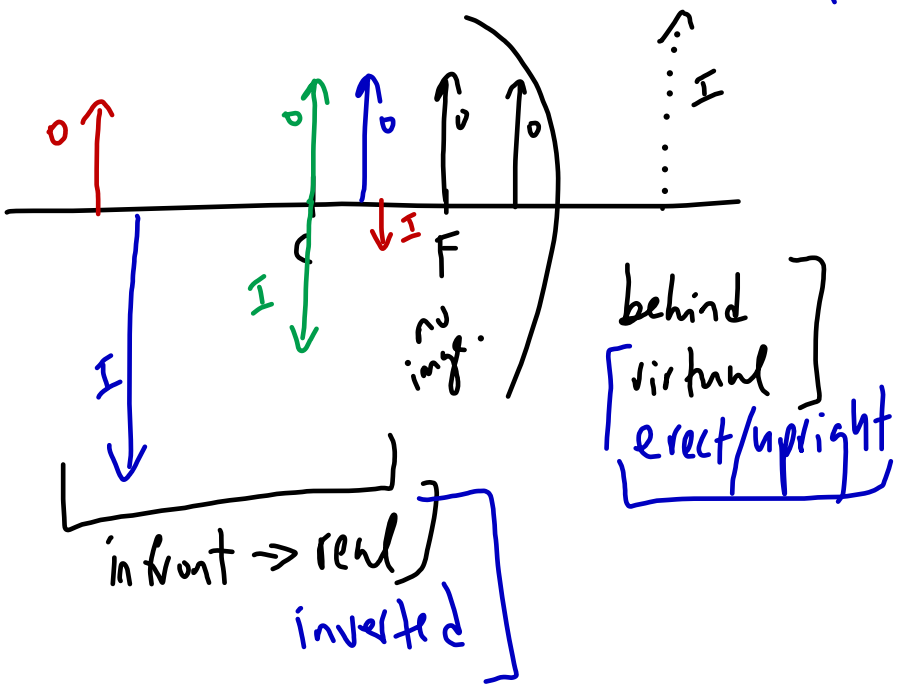
P - beyond C
O - inverted
S - larger
T - real

4. Object At F



5. Object Between F and Mirror





Science 10

http://mvhs.nbed.nb.ca/

Wednesday, March 30/16

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1. Lab - Types of Reactions, Gas Collection and More
   - 2 Days Late
2. Check -> Worksheet - Page 349 -> Do #1-4
3. Certainty Rule for Multiplying and Dividing Measurements
4. Worksheet: Page 349 -> #6 -> Do a-d
5. Precision Rule for Adding and Subtracting
6. Worksheet: Page 349 -> #6 -> Do e-j
7. Defining Equations - To Be Continued

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8. Area Calculations
9. Experiment: Measurement and Significant Digits
10. Rearranging Equations
11. Metric Conversions

Unit 2 - Motion

Physics is the study of matter and energy and their relationships.

Kinematics (a branch of physics) is the study of how matter moves.

Linear motion is motion in one direction.

You will need a calculator for this unit.

Physical Quantities

A physical quantity is a physical property that can be measured. Examples are distance, time, and speed.

SI System of Units

International System of Units

Systeme International d'Unités

$125 - Million Dollar Mistake

An example of miscommunication is provided by the $125-million mistake made on a 1999 Earth-to-Mars space probe (Figure 4). The specifications for the probe were sent by the contractor in British units but were interpreted by NASA as being in metric units. The probe ended up crashing on Mars instead of orbiting.

Figure 4
In October 1999, a Mars probe was destroyed because its makers did not follow the scientific convention of communication.

Measurements of physical quantities always require units.

Base Units

distance - m (metre)
time - s (second)
mass - kg (kilogram)

Derived Units

speed - } m/s
velocity -
acceleration - $\frac{m}{s^2}$

* force (1 N) = $\frac{1\ kgm}{s^2}$

newton

derived

★

Certainty and Significant Digits

(Page 344)

Every measurement has uncertainty.

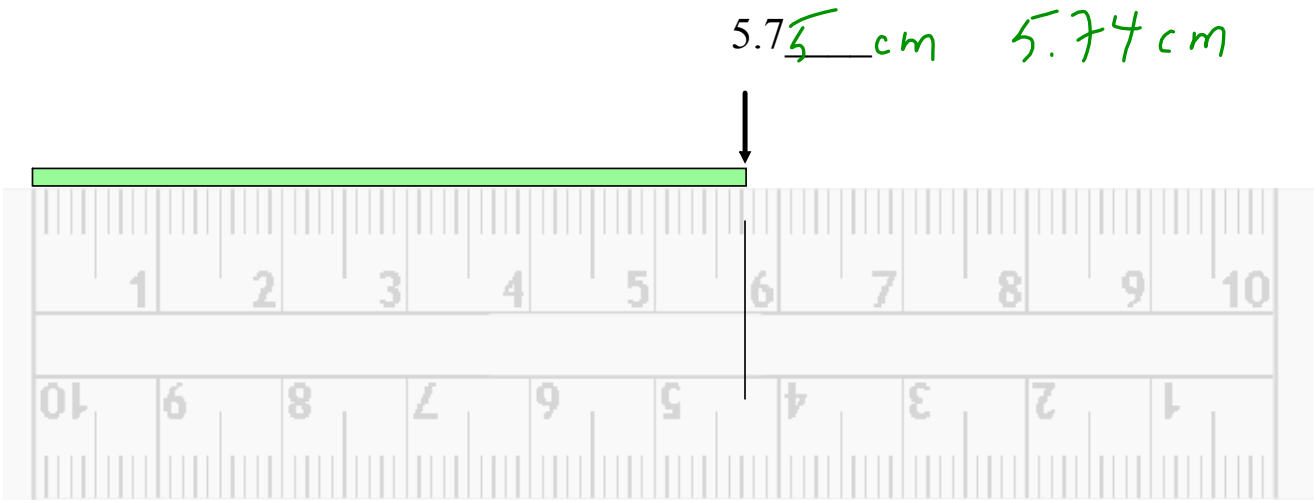
The international agreement about the correct way to record measurements is to record all digits that are certain plus one uncertain digit.

The "certain-plus-one" digits are called significant digits (SDs).

Example

The length of the "green thing" is somewhat longer than 5.7 cm.
The last digit is an estimate and uncertain.

5.7~~5~~ cm 5.74 cm



The certainty of a measurement is determined by its number of significant digits. The greater the number of significant digits, the greater the certainty of the measurement.

✓ – certain
? – uncertain (estimated)

✓✓✓? 307.0 cm #SD - 4

✓ ✓? 6.8 m/s #SD - 2

? ✓✓? 0.00506 km #SD - 3

✓✓? 4.10×10^2 km #SD - 3

Physics ✓✓? 200 kg SD = 3

Chemistry. 200 kg SD = 1

200. kg SD = 3

2.00×10^2 kg

2×10^2 kg

☆

Counted and Defined Values

p. 344

$E_K = \frac{1}{2}mv^2$

Table 2 Exact Values

Counted values	Defined values
4 dogs	1000 m/km
10 CDs	10 mm/cm
3 Blue Jays	1 h/60 min

1000m = 1km
10mm = 1cm
1h = 60min

Rounding Values

Round to 3 SDs.

23.437 km

23.4 km

Round to 4 SDs.

23.437 km

23.44 km

mwh29

Physics 122

Thursday, March 30/16

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1. Check -> Worksheets - Relative Velocity Problems
   Worksheet: 1D Collisions
   Worksheet - Collisions: Elastic and Inelastic
2. 2D Collisions
3. Worksheet - 2D Collisions
   Worksheet - Physics 30 Worksheet #4

U1-S3+4 -> Trad.
Test Unit 1 -> Frid.

1D

head-on collision

elastic
$\vec{p}$ conserved
$\Delta E_k = 0J$

inelastic
$\vec{p}$ conserved
$\Delta E_k = -J$

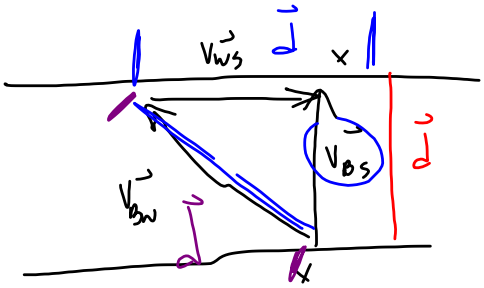
$$\Delta E_k = \underbrace{E_k'}_{\text{system}} - \underbrace{E_k}_{\text{system}}$$

$$\rightarrow \Delta E_k = E_{k1}' + E_{k2}' - (E_{k1} + E_{k2})$$

$$* E_k = \frac{1}{2}mv^2$$

$$\Delta E_k = \frac{1}{2}m_1\left(v_1'\right)^2 + \frac{1}{2}m_2\left(v_2'\right)^2 - \frac{1}{2}m_1v_1^2 - \frac{1}{2}m_2v_2^2$$

Relative Velocity



$V = \frac{d}{t}$

$t = \frac{V}{d}$

$t = \frac{v_{WS}}{d}$ $t = \frac{v_{BW}}{d}$ $t = \frac{v_{BS}}{d}$