

Scientific Notation and Unit Prefixes – Answer Key

Make the following conversions:

1) 3.4 liters to milliliters
3400 mL

6) 45 meters to centimeters
4500 cm

2) 876 millimeters to meters
0.876 m

7) 11.7 grams to kilograms
0.0117 kg

3) 78,999 milligrams to grams
78.999 g

8) 0.0009 kiloliters to liters
0.9 L

4) 0.9 centigrams to grams
0.09 g

9) 44 centimeters to meters
0.44 m

5) 112 meters to millimeters
112,000 mm

10) 277 kilograms to grams
277,000 g

Convert the following to scientific notation:

11) 45,700 4.57×10^4

12) 0.009 9×10^{-3}

13) 23 2.3×10^1

14) 0.9 9×10^{-1}

15) 24,212,000 2.4212×10^7

16) 0.000665 6.65×10^{-4}

Convert the following to scientific notation:

- 17) 21.9 2.19×10^1
- 18) 0.00332 3.32×10^{-3}
- 19) 321 3.21×10^2
- 20) 0.119 1.19×10^{-1}
- 21) 1492 1.492×10^3
- 22) 0.2713 2.713×10^{-1}
- 23) 314159 3.14159×10^5
- 24) 6022 6.022×10^3
- 25) 0.12011 1.2011×10^{-1}

Convert the following numbers in scientific notation to expanded form:

- 26) 3.825×10^3 3,825
- 27) 6.3×10^4 63,000
- 28) 2.3×10^{-2} 0.023
- 29) 4.44×10^{-6} 0.00000444
- 30) 7.121×10^9 7,121,000,000
- 31) 1.2×10^{-1} 0.12
- 32) 1.8×10^2 180
- 33) 8.1×10^{-4} 0.00081
- 34) 6.7×10^5 670,000
- 35) 3.4×10^7 34,000,000

KEY

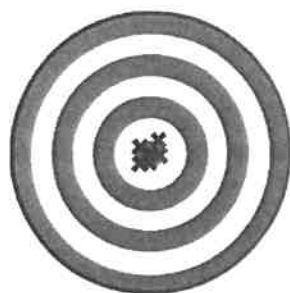
Precision vs Accuracy

1. Define precision and accuracy.

Precision: - the ability to consistently reproduce a measurement.

Accuracy: - the ability of a measurement to match the actual value.

2. Label the following dart boards as precise OR not precise AND accurate OR not accurate.



Accurate

Precise



Not accurate

Precise



(Average)

Accurate

NOT Precise



Not accurate

NOT Precise

3. Use the data table below for the following questions.

Student #1	25.5g	25.4g	25.6g
Student #2	24.6g	24.5g	24.4g
Student #3	19.2g	27.8g	14.1g

Assuming the actual mass of the object is 25.5g, describe each student's data using terms precise and accurate. You should calculate the mean (i.e., of each data set first)

Student #1: accurate AND Precise (Average = 25.5g)

Student #2: NOT accurate but is Precise (Average = 24.5g)

Student #3: NOT accurate AND NOT Precise (Average = 20.36g)

Science 9

GRAPHING POST TEST

The following data was collected by measuring the amount of resistance in an electrical circuit as the amount of voltage was increased.

Voltage (V)	Resistance (Ω)
15	6
30	12
45	15
60	23
75	30
90	32
105	37
120	46
135	51
150	56

Graph the above data and answer the following questions. Remember to place the dependant and independent variables on the correct axis, label the axis correctly, use the correct scale (at least $\frac{1}{2}$ of the graph in both directions) with the correct units and supply the correct and complete title.

1. Which variable is the independent variable?

Voltage

2. When the voltage in the circuit is 0 volts, what should the resistance be?

0

3. Calculate the slope of the line.

$0.38 \frac{\Omega}{V}$

4. What would be the resistance when the voltage is 160 V? (Use interpolation)

$\sim 60 \Omega$

5. What voltage would result in a resistance of 35 Ω ? (use $y = mx + b$ and show work)

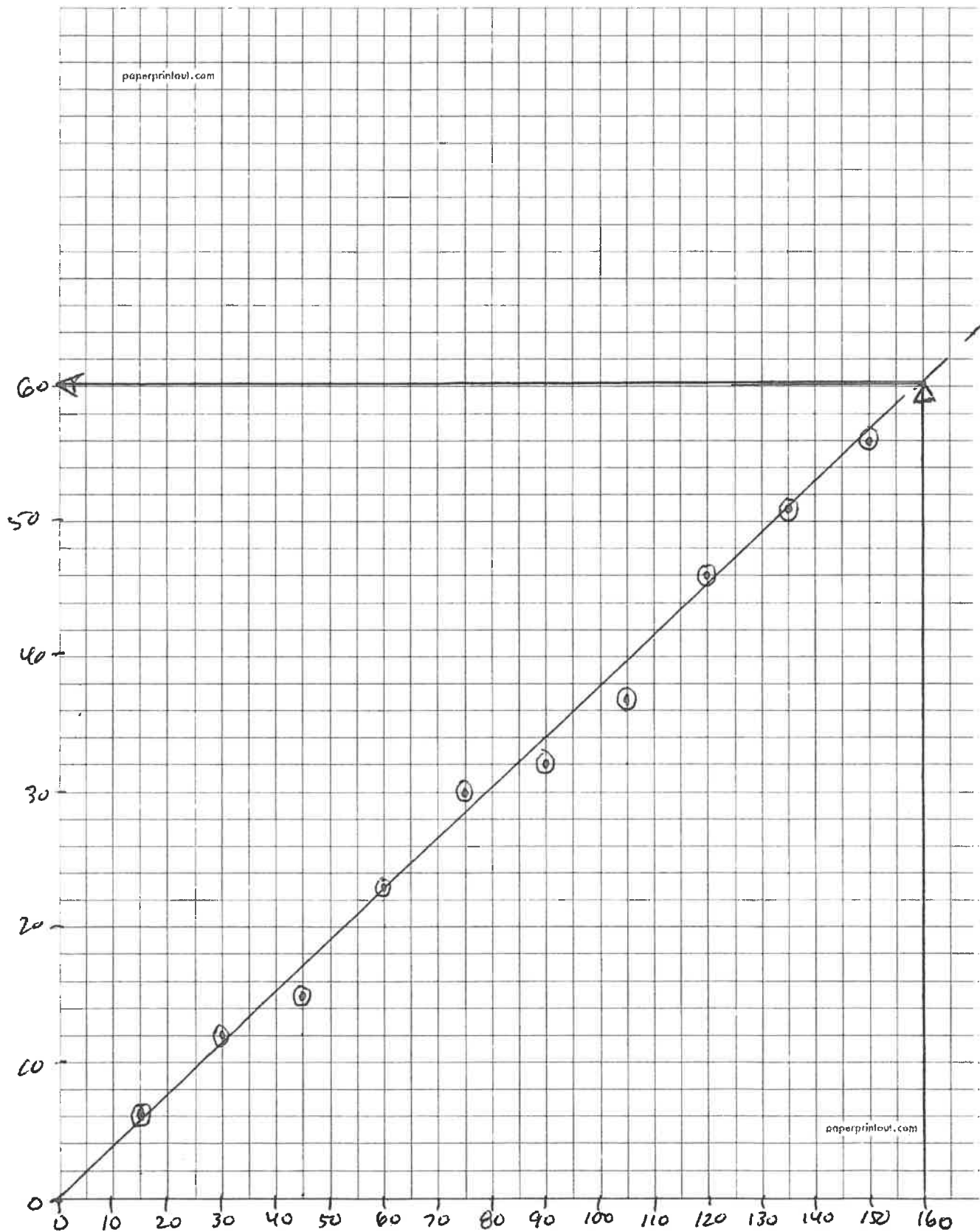
$$m = 0.38 \quad b = 0 \quad \text{so} \quad y = 0.38x + 0$$

$$35 = 0.38x$$

$$\boxed{\sim 92.1V = x}$$

Voltage (V) vs Resistance (Ω) of AN electric Circuit

Resistance (Ω)



Voltage (V)