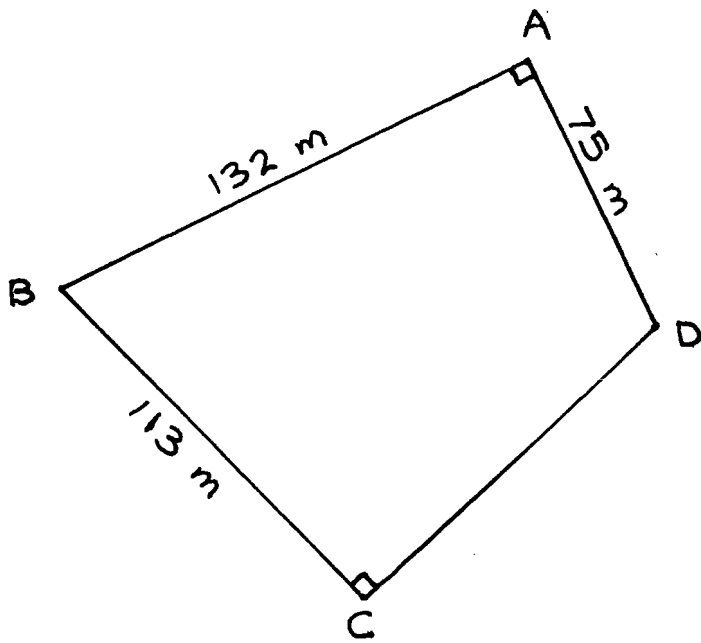
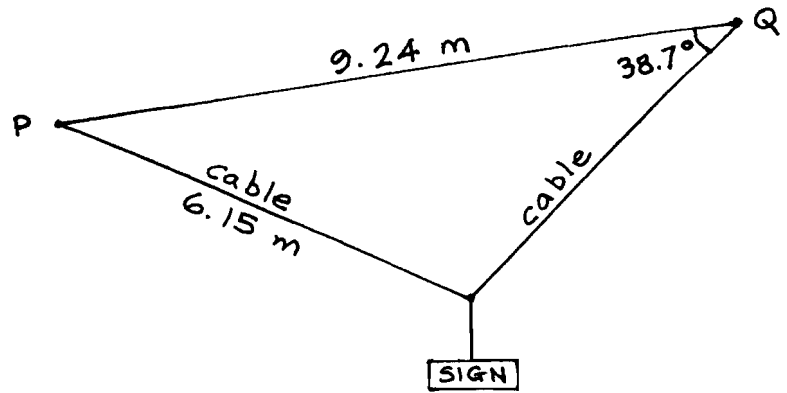


- (7) 3. A piece of land has the shape shown. Find angle D (i.e. angle ADC) in degrees to 2 decimal places.



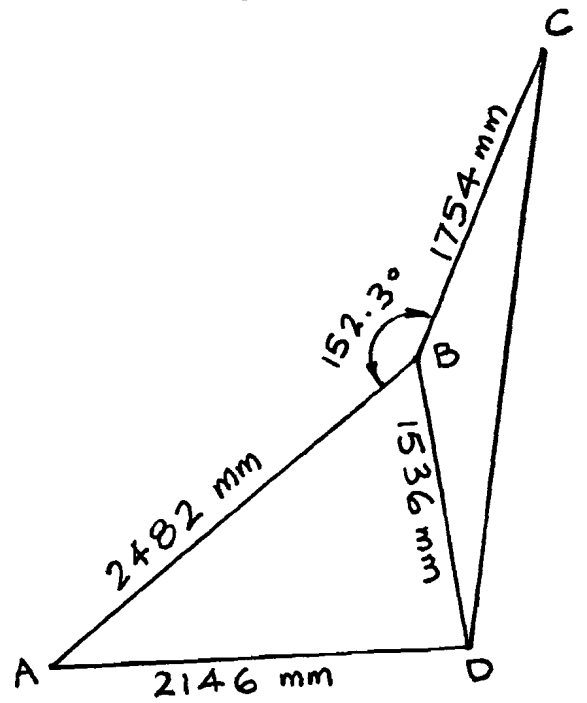
4. A sign hangs from 2 cables attached at points P and Q (drawn to scale below).
(5) a) Find the angle between the 2 cables. (Give the answer to 1 decimal place.)



- (3) b) Find the length of the cable on the right (to 2 decimal places).

- (8) 5. Find the length of side CD (no decimal places). (Hint: First find angle ABD.)

34



Name: _____

1. Answer the following, rounding properly using the rules discussed in class:

(1½) a) A technician measures out 14.9 kg of soil and then extracts samples of 0.792 kg and 6.24 kg from it. How much was left?

(1½) b) The measured radius of a circle is 17 mm. Find the circumference of the circle. (Show your answer in a format that displays the accuracy exactly.)

(1½) c) An object's mass while submerged in water and its mass in air are measured:

mass submerged = 19.7 g and mass in air = 29.2 g

Calculate the object's density (g/cm^3) using the following formula

$$\text{density} = \frac{\text{mass in air}}{\text{mass in air} - \text{mass in water}}$$

2. Evaluate to 4 significant digits:

(3) a)
$$\frac{-7.259 \times 10^{11}}{(0.000\ 000\ 000\ 527\ 1)(15.251 \times 10^{21})}$$

Answer: _____

(3) b)
$$\frac{10^{-5} - (1.491 \times 10^{-7})\pi^2}{\sqrt{\pi} - \left(2.391^2 - \frac{1}{7.221}\right)^2}$$

Answer: _____

- ($\frac{1}{2}$) 3. Fill in the blanks: a) 0.000 303 0 has _____ significant figures.
- ($\frac{1}{2}$) b) 4 200 000 has _____ significant figures.
- ($\frac{1}{2}$) c) 42.00 has _____ significant figures.
- ($\frac{1}{2}$) d) 7.007 10 has _____ significant figures.
- (1) e) 578 500 rounded to 3 significant figures is _____.
- (1) f) 0.009 87 rounded to 1 significant figure is _____.
- (1) g) 745 250 rounded to 2 significant figures is _____.
- (1) h) 51.4 kL is more precise than _____ kL.
- (1) i) 245.0 N is more accurate than _____ kN.
- (1) j) In scientific notation 2.23 is _____.
- (1) k) In scientific notation 0.024 500 is _____.
- (1) l) A scale accurate to the gram reads 11 100 g. This equals _____ kg.
- (1) m) Change 3.70×10^{-4} to ordinary notation _____.
- (1) n) _____ is **assumed** to have 4 significant digits.
- (1) o) $0.002\ 59 = 2590 \times 10$ _____ (give a power)

- (1) 4. a) You are writing an essay and want to give SI values in mm for values given in inches in your reference document. Fill in the 2 blanks below with reasonable values for the original values in inches (indicated below each space). Note: 1 inch = 25.4 mm

The amount of gravel covering pipes is typically between _____ mm and _____ mm.
 (12 inches) (20 inches)

- (2½) b) Circle all errors in SI style in the following statement and show corrections for your circled items on the line below.

They pumped 22,000KL of water into the reservoir using 1080 Mj. of energy.

- (13) 5. Fill in the blanks. (All questions involve SI units.)

a) On a road construction drawing, what would the units of the following dimensions be:

i) 5200 _____ ii) 3.640 _____

b) $4200 \text{ m}^2 =$ _____ ha

c) 2.3 L of water has a mass of _____ g

d) Concrete with a density of 2275 kg/m^3 has a relative density (R.D.) = _____

e) $12 \text{ L} =$ _____ cm^3

f) $1 \text{ m}^3 =$ _____ cm^3

g) $2.5 \text{ kPa} =$ _____ N/m^2

h) $2750 \text{ N} =$ _____ MN

i) $72 \text{ }\mu\text{m} =$ _____ mm

j) $0.7 \text{ t} =$ _____ Mg

k) 1 kHz represents _____

l) $422\,000 \text{ mm}^2 =$ _____ m^2

m) A mass of 322 g has a weight of _____

Name: _____

1. Complete the following using the method outlined in class. Show all steps.

(6) 1. a) Convert $42.5 \text{ cm}^3/\text{s}$ to ft^3/h . (Use $1 \text{ m} = 3.281 \text{ ft}$)

(6) b) Convert 22.3 L to in^3 (Use $1 \text{ in} = 2.54 \text{ cm}$)

- (4) 2. In the formula $F = Scd + F_a - F_b$, what single unit does S have if F_b is in newtons and c and d are in metres? (Show your work. Give 1 unit for S , not a combination.)

- (4) 3. Find the units of V in the formula $V = \sqrt{\frac{P_1 - P_2}{\frac{1}{2}d}}$ (Show your work.) $(P_1$ and P_2 are in N/m^2 , the $\frac{1}{2}$ is unitless, d is in kg/m^3 , and $1 \text{ N} = 1 \text{ kg}\cdot\text{m/s}^2$)

- (5) 4. Simplify the following as much as possible, expressing your answer using positive exponents. (Show your work.)

$$-2^2 + (a^7 - a^5) + \sqrt{b^9} + \frac{1}{2c^{-4}} + 3d^0$$

- (8) 5. Simplify the following as much as possible, writing your answer using positive exponents. (Show your work.)

$$\left(\frac{cd^{-2}}{c^2d^2}\right) (8c^{-3}d^6)^{1/3} \left(\frac{5d}{c^2}\right)^{-2} (4c^0)$$

- (6) 6. Evaluate on your calculator to 4 significant figures. Show values for the numerator
39 and the denominator as well as the final answer.

Total

$$\frac{(-3.924^{-5.2} + \sqrt{0.0009917\pi^2})^{-5}}{51.764^{\frac{1}{4}} - \left(\frac{1}{\sqrt[7]{3.243^2}} + 2.2439\right)^{\frac{-13}{24}}}$$

(entire numerator) ↗

= _____ = _____ (final answer)

↖ (entire denominator)

Name: _____

(8) 1. Expand and simplify: $\frac{2^4}{k} - 2\left\{2 - \frac{2}{k}\left[\frac{k}{2} - (2k - 2)^2\right] - k\right\}$

(8) 2. Expand and simplify:
$$\frac{3c^2d^2(3c - 2d)\left(\frac{c}{3d}\right)(3c + 2d)}{2c^3d}$$

3. Solve for w:

$$w^2 + \frac{2w}{6} - \frac{w-3}{24} = (w-1)^2 + \frac{w+4}{8}$$

- (8) 4. Solve for m and n using substitution.
(to 4 sig. figs.)

$$-3.50 + 2n = 1.58m$$

$$0.424m - 152.6 = 0.728n$$

- (8) 5. Solve using addition or subtraction:

$$1.5p + 0.3q = -9$$

$$0.6p + 0.7q = 2.2$$

40