

Solution of the day Aug 17, 2018

6th Class

- **Mathematics:** Ans : (A)
- **Physics:** Ans: (A)
- **Chemistry:** Ans: (B)
- **Biology:** Ans: (C)

7th Class

- **Mathematics:** Ans: (A)
- **Physics:**

Sol: (i) Least count = 1 M.S.D. – 1 V.S.D.

$$(ii) \text{ L.C.} = \left\{ \frac{p-q}{p} \right\} \text{ M.S.D.} = \frac{k(p-q)}{10p} \text{ cm}$$

- **Chemistry:** Ans: (B)
- **Biology:** Ans: (A)

8th class

- **Mathematics:** Ans: (B)
- **Physics:** Sol: (C)
- **Chemistry:** Ans: (A)
- **Biology:** Ans: (B)

9th Clas

- **Mathematics:**

Sol: (B) Given $3 \sin \theta + 5 \cos \theta = 5$

Squaring on both sides we have

$$9 \sin^2 \theta + 25 \cos^2 \theta + 30 \sin \theta \cos \theta = 25$$

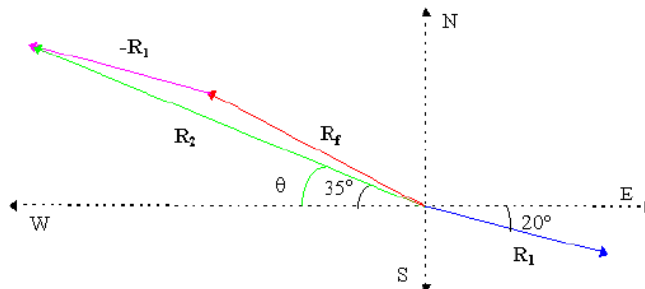
$$9 - 9 \cos^2 \theta + 25 - 25 \sin^2 \theta + 30 \sin \theta \cos \theta = 25$$

$$9 = 9 \cos^2 \theta + 25 \sin^2 \theta - 30 \sin \theta \cos \theta$$

$$9 = (5 \sin \theta - 3 \cos \theta)^2 \Rightarrow (5 \sin \theta - 3 \cos \theta) = \pm 3$$

- **Physics :**

Sol:



Then to solve the problem numerically, we break the vectors into their components.

$$R_f = i[-225\cos(35^\circ)] + j[225\sin(35^\circ)] = i[-184.309] + j[129.055]$$

$$R_1 = i[150\cos(20^\circ)] + j[150\sin(20^\circ)] = i[140.954] + j[-51.303]$$

Next we subtract them to get the components of vector R_2 .

$$R_2 = i[-184.309 - 140.954] + j[129.055 - (-51.303)] = i[-325.263] + j[180.358]$$

Finally we convert to polar coordinate form

$$\text{Using Pythagoras' Theorem } R_2 = [(325.263)^2 + (180.358)^2]^{1/2} = 371.921\text{ m}$$

$$\text{The angle } \theta = \arctan(|R_{2y} / R_{2x}|) = \arctan(180.358 / 325.263) = 29.01^\circ.$$

Thus the other displacement is 372 m at 29.0° north of west

➤ **Chemistry:** Ans: (C)

➤ **Biology:** Ans: (C)

10th class

➤ **Mathematics:**

Sol: (A) We have, $\cot \alpha \cot \beta = 2$

$$\Rightarrow \frac{\cos \alpha}{\sin \alpha} \frac{\cos \beta}{\sin \beta} = \frac{2}{1}$$

$$\Rightarrow \frac{\cos \alpha \cos \beta}{\sin \alpha \sin \beta} = \frac{2}{1}$$

∴ By componendo and dividendo

$$\frac{\cos \alpha \cos \beta - \sin \alpha \sin \beta}{\cos \alpha \cos \beta + \sin \alpha \sin \beta} = \frac{2-1}{2+1}$$

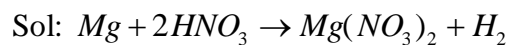
$$\Rightarrow \frac{\cos(\alpha + \beta)}{\cos(\alpha - \beta)} = \frac{1}{3}$$

➤ **Physics:** Ans:

$$\Delta U = mgh = 10 \times 10 \times 10 = 1000 \text{ J}$$

$$= \frac{1000}{4.186} \text{ cal}$$

➤ **Chemistry:**



➤ **Biology:**

Ans: (A)

➤ **Reasoning :**

Ans: (D)

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