RAHUL'S SCIENCE ACADEMY

BALEWADI HIGH STREET, 411045

JEE/CET CLASSES

PH 7020329384/7588305622

SOLUTION OF TRIANGLE

Problem 1

If the angles of a triangle are in the ratio 4:1:1, then the ratio of the longest side to the perimeter is

[IIT Screening 2003]

(A) $\sqrt{3}:(2+\sqrt{3})$ (B) $1:6$

(C) $1:(2+\sqrt{3})$ (D) $2:3$

Problem 2

The perimeter of a ΔABC is 6 times the arithmetic mean of the sines of its angles. If the side a is 1, then the angle A is

[IIT Screening 1992; DCE 1999]

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{2}$ (D) π

Problem 3

If angles A, B and C are in A.P., then $\frac{a+c}{b}$ is equal to **[WB JEE 2010]**

(A) $2\sin\frac{A-C}{2}$ (B) $2\cos\frac{A-C}{2}$

(C) $\cos\frac{A-C}{2}$ (D) $\sin\frac{A-C}{2}$

Problem 4

If one side of a triangle is double the other and the angles opposite to these sides differ by 60°, then the triangle is

[Karnataka CET 2009]

(A) Isosceles (B) Right angled

(C) Obtuse angled (D) Acute angled

Problem 5

In any triangle ABC, the simplified form of $\frac{\cos 2A}{a^2}-\frac{\cos 2B}{b^2}$ is

[Karnataka CET 2011]

(A) a^2-b^2 (B) $\frac{1}{a^2-b^2}$

(C) $\frac{1}{a^2}-\frac{1}{b^2}$ (D) a^2+b^2

Problem 6

In a ΔABC, if $c^2+a^2-b^2=ac$, then $\angle B=$ **[MP PET 1983, 89, 90]**

(A) $\frac{\pi}{6}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{3}$ (D) None of these

Problem 7

In ΔABC, if $(a+b+c)(a-b+c)=3ac$, then **[AMU 1996]**

(A) $\angle B=60°$ (B) $\angle B=30°$

(C) $\angle C=60°$ (D) $\angle A+\angle C=90°$

Problem 8

In ΔABC, $a=2cm$, $b=3cm$ and $c=4$ cm, then angle A is **[MNR 1973; MP PET 1984; 2002]**

(A) $\cos^{-1}\left(\frac{1}{24}\right)$

(B) $\cos^{-1}\left(\frac{11}{16}\right)$

(C) $\cos^{-1}\left(\frac{7}{8}\right)$

(D) $\cos^{-1}\left(-\frac{1}{4}\right)$

Problem 9

If the lengths of the sides of a triangle are 3, 5, 7, then the largest angle of the triangle is **[IIT Screening 1994; Kerala (Engg.) 2002]**

(A) $\frac{\pi}{2}$ (B) $\frac{5\pi}{6}$

(C) $\frac{2\pi}{3}$ (D) $\frac{3\pi}{4}$

Problem 10

In ΔABC, $\frac{\sin(A-B)}{\sin(A+B)}=$ **[MP PET 1986]**

(A) $\frac{a^2-b^2}{c^2}$ (B) $\frac{a^2+b^2}{c^2}$

(C) $\frac{c^2}{a^2-b^2}$ (D) $\frac{c^2}{a^2+b^2}$

Problem 11

In a triangle ABC, if $\frac{1}{a+c}+\frac{1}{b+c}=\frac{3}{a+b+c}$ then angle C is equal to

[BCECE 2015]

(A) $30°$ (B) $60°$
(C) $90°$ (D) $120°$

Problem 12

In a ΔABC, $\angle C=\frac{\pi}{3}$, then $\frac{3}{a+b+c}-\frac{1}{a+c}=$

[EAMCET 2015]

(A) $\frac{1}{a+b}$ (B) $\frac{1}{b+c}$
(C) $\frac{1}{2a+b}$ (D) $\frac{1}{b+2c}$

Problem 13

In a ΔABC, if $\frac{b+c}{11}=\frac{c+a}{12}=\frac{a+b}{13}$, then $\cos C=$ **[Karnataka CET 2003]**

(A) $\frac{7}{5}$ (B) $\frac{5}{7}$
(C) $\frac{17}{16}$ (D) $\frac{16}{17}$

Problem 14

In any ΔABC under usual notation, $a(b\cos C - c\cos B) =$ **[J & K 2008]**

(A) b^2-c^2 (B) c^2-b^2
(C) $\frac{b^2-c^2}{2}$ (D) $\frac{c^2-b^2}{2}$

Problem 15

If a, b and c are the sides of a triangle such that $a^4+b^4+c^4=2c^2(a^2+b^2)$, then the angles opposite to the side c is

[J & K 2005; Kerala (Engg.) 2006]

(A) $45°$ or $135°$ (B) $30°$ or $100°$
(C) $50°$ or $100°$ (D) $60°$ or $120°$

Problem 16

In a ΔABC, if $\frac{\sin A}{\sin C}=\frac{\sin(A-B)}{\sin(B-C)}$, then a^2, b^2, c^2 are in

[Karnataka CET 1999; Pb. CET 2001]

(A) A.P. (B) G.P.
(C) H.P. (D) None of these

Problem 17

If $4\sin A = 4\sin B = 3\sin C$ in a ΔABC, then $\cos C =$ **[J & K 2008]**

(A) $\frac{1}{3}$ (B) $\frac{1}{9}$
(C) $\frac{1}{27}$ (D) $\frac{1}{18}$

Problem 18

Let D be the middle point of the side BC of a triangle ABC. If the triangle ADC is equilateral, then $a^2 : b^2 : c^2$ is equal to

[Pb. CET 2004]

(A) 1 : 4 : 3 (B) 4 : 1 : 3
(C) 4 : 3 : 1 (D) 3 : 4 : 1

Problem 19

If in ΔABC, $2b^2=a^2+c^2$, then $\frac{\sin 3B}{\sin B}=$

[UPSEAT 1999]

(A) $\frac{c^2-a^2}{2ca}$ (B) $\frac{c^2-a^2}{ca}$
(C) $\left(\frac{c^2-a^2}{ca}\right)^2$ (D) $\left(\frac{c^2-a^2}{2ca}\right)^2$

Problem 20

Let ABC be a triangle such that $\angle ACB=\frac{\pi}{6}$ and let a, b and c denote the lengths of the sides opposite to A, B and C respectively. The value(s) of x for which $a=x^2+x+1$, $b=x^2-1$ and $c=2x+1$ is (are)

[IIT JEE 2010]

(A) $-(2+\sqrt{3})$ (B) $1+\sqrt{3}$
(C) $2+\sqrt{3}$ (D) $4\sqrt{3}$

Problem 21

If a = 16, b = 24, c = 20, then $\cos\left(\frac{B}{2}\right)=$

[MH CET 2013]

(A) $\frac{3}{4}$ (B) $\frac{1}{4}$
(C) $\frac{1}{2}$ (D) $\frac{1}{3}$

Problem 22

The area of an isosceles triangle is 9 cm^2. If the equal sides are 6 cm in length, the angle between them is **[MP PET 1986]**

(A) $60°$ (B) $30°$

(C) $90°$ (D) $45°$

Problem 23

The area of triangle ABC in which a = 1, b = 2, $\angle C = 60°$ is **[MP PET 2004]**

(A) $\frac{1}{2}$ (B) $\sqrt{3}$

(C) $\frac{\sqrt{3}}{2}$ (D) $\frac{3}{2}$

Problem 24

In a ΔABC, $a^2 \sin 2C + c^2 \sin 2A =$ **[EAMCET 2001]**

(A) Δ (B) 2Δ

(C) 3Δ (D) 4Δ

Problem 25

If in a triangle ABC, $b = \sqrt{3}$, $c = 1$ and $B - C = 90°$, then $\angle A$ is **[MP PET 1983]**

(A) $30°$ (B) $45°$

(C) $75°$ (D) $15°$