Triangle

Solution

1. **Answer: (A)**

Clearly,

$P + b + h = 70$ …….(i)

Also, $P^2 + b^2 = h^2$ …….(ii)

P = 21, b = 20, h = 29 satisfies both the equations

So, Area = $1/2 \times P \times b$

$= 1/2 \times 21 \times 20$

$= 210$

2. **Answer: (D)**

Area = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4} \times (4)^2$

$= 4\sqrt{3}$ cm^2

3. **Answer: (C)**

Height of equilateral tringle = $\frac{\sqrt{3}}{2}$ a

$\frac{\sqrt{3}}{2}$ a $= 20\sqrt{2}$

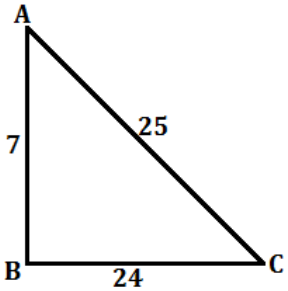
a = $40\sqrt{\frac{2}{3}}$

Area of equilateral tringle = $\frac{\sqrt{3}}{2}$ a^2

$= \frac{\sqrt{3}}{4} \times 40 \times 40 \times \frac{2}{3}$

$= \frac{1}{3} \times 800\sqrt{3}$

4. **Answer:(C)**

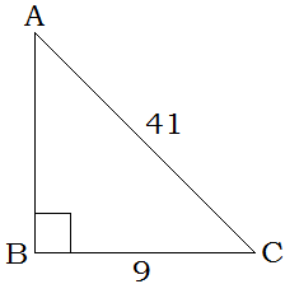


Area of triangle = $\frac{1}{2}$ × base × altitude

= $\frac{1}{2} \times 24 \times 7$

= 84 cm^2

5. **Answer:(A)**



Height = $\sqrt{41^2 - 9^2}$

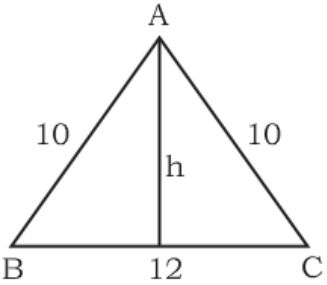
Height = $\sqrt{1600}$

Height = 40 cm

Area of triangle = 1/2 × base × altitude

= 1/2 × 9 × 40 = 180 cm^2

6. **Answer:(B)**



h = $\sqrt{10^2 - 6^2}$

h = 8cm

Area of triangle = 1/2 × base × altitude

= 1/2 × 12 × 8

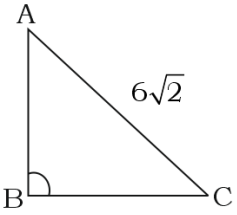
= 48 cm^2

7. **Answer:(B)**

Angle of triangle are = 4x = 180º

x=45º

Angles are = 45º, 45º, 90º



AB^2 + BC^2 =AC^2

$2AB^2 = 72$
$AB^2 = 36$
AB = 6cm = BC
Area of triangle = $12\times6\times6 = 18cm^2$

8. Answer : C

Side of a square = 12
Diagonal= a $\sqrt{2} = 12\sqrt{2}$
Area of an equilateral triangle with side $12\sqrt{2}$
$= \frac{\sqrt{3}}{4}a^2$
$= \frac{\sqrt{3}}{4}\left(12\sqrt{2}\right)^2$
$= \frac{\sqrt{3}}{4} \times 144 \times 2 = 72\sqrt{3}$

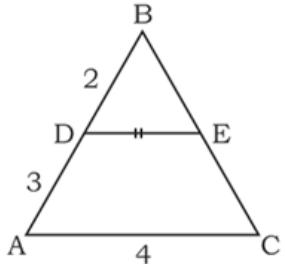
9. Answer : (B)

Side of square = a = 10 cm
Diagonal of square = $\sqrt{2} \times a = \sqrt{2} \times 10$ cm
Side of equilateral triangle= diagonal of square = $\sqrt{2} \times 10$
Area of equilateral triangle = $(\sqrt{3}/4) \times side^2 = (\sqrt{3}/4)(\sqrt{2} \times 10)^2 = 50\sqrt{3}\ cm^2$

10. Answer : (A)

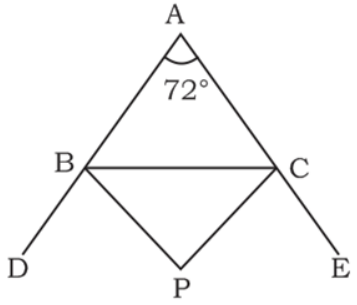
Area of equilateral traingle
$= \frac{(side)^2\sqrt{3}}{4}$
Given,
Side = 8 cm
Area of the triangle = $(8^2\sqrt{3}) / 4$
∴ Area of the triangle = $16\sqrt{3}\ cm^2$

11. Answer: (A)



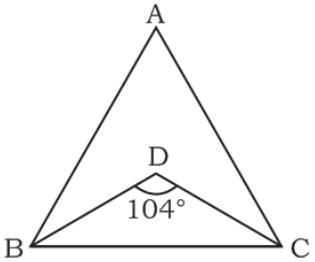
$\Delta BDE \sim \Delta BAC$
$\frac{Ar(\Delta BDE)}{Ar(\Delta ABC)} = \left[\frac{BD}{AB}\right]^2 = \left[\frac{2}{5}\right]^2$
$\frac{Ar(\Delta BDE)}{Ar(\Delta ABC)} = \frac{4}{25}$
$\frac{Ar(\Delta BDE)}{Ar(\Delta ACED)} = \frac{4}{25-4} = \frac{4}{21}$

12. Answer: (D)



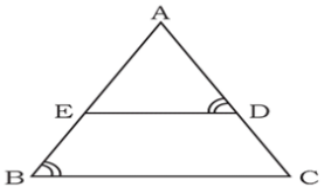
$\angle BPC = 90^0 - \frac{\angle A}{2}$
$\angle BPC = 90^0 - \frac{72^0}{2}$
$\angle BPC = 90^0 - 36^0$
$\angle BPC = 54^0$

13. Answer: (A)



When bisectors of ∠B and ∠C meet at point D
$\angle BDC = 90° + 2\angle A$
$104° = 90° + 2\angle A$
$\angle A = 28°$

14. Answer: (D)



$= \Delta ADE \sim \Delta ABC$
$= \frac{AD}{AB} = \frac{DE}{BC}$
$= \frac{7.6}{7.2+4.2} = \frac{DE}{8.4}$
$\frac{7.6}{11.4} = \frac{DE}{8.4}$
DE =5.6cm

15. Answer: (A)

Since $\Delta ABC \sim \Delta QPR|$

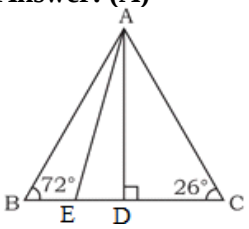
$\frac{Ar(\Delta ABC)}{Ar(\Delta QPR)} = \left[\frac{AB}{QP}\right]^2 = \left[\frac{BC}{PR}\right]^2 = \left[\frac{AC}{QR}\right]^2$

$\frac{9}{16} = \left[\frac{AB}{QP}\right]^2$

$\frac{3}{4} = \frac{12}{QP}$

$\boxed{QP = 16cm}$

16. Answer: (A)

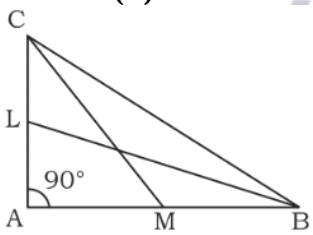


$\angle DAE = 1/2\ (\angle B - \angle C)$

$\angle DAE = 1/2\ (72^0 - 26^0)$

$\angle DAE = 23^0$

17. Answer: (B)



In ΔLAB

$\left[\frac{AC}{2}\right]^2 + AB^2 = BL^2$

$AC^2 + 4AB^2 = 4BL^2$ ---------- (1)

In ΔLAB

$\left[\frac{AC}{2}\right]^2 + AB^2 = BL^2$

$4AC^2 + AB^2 + 4CM^2$……. (2)

Adding (1) and (2)

$5\ [AC^2 + AB^2] = 4[BL^2 + CM^2]$

$4[BL^2 + CM^2] = 5BC^2$

18. Answer: (A)

$\Delta ABC \sim \Delta QPR$

then

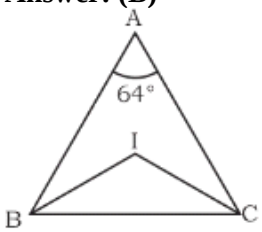
$\frac{Ar(ABC)}{Ar(QPR)} = \left[\frac{AB}{QP}\right]^2 = \left[\frac{BC}{PR}\right]^2 = \left[\frac{AC}{QR}\right]^2$

$\frac{9}{16} = \left[\frac{9}{QR}\right]^2$

$\frac{3}{4} = \frac{9}{QR}$

QR = 12cm

19. Answer: (B)

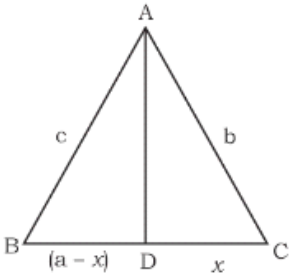


$\angle BIC = 90° + \frac{\angle A}{2}$

$\angle BIC = 90° + \frac{64°}{2}$

$\angle BIC = 122°$

20. Answer: (C)



According to internal bisector theorem

AB/AC=BD/BC

Let CD = x

A.T.Q

cb=a – xx

cx = ab – bx

x = ab/b + c _____ (i)

From (1)

BD = a – ab/b + c

BD = ab +ac–ab/b + c

BD = acb + c

A.T.Q

= BD – DC

= ac/b + c–ab/b + c

= a(c–b)/b + c