How much volume of wood is required..

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MODEL QUESTIONS

1. In the base and height of a triangle are doubled, then find the ratio of initial area and new area of the triangle.
a) 4 : 1 b) 2 : 5
c) 1 : 4 d) 2 : 1

Sol: $\Delta_1 = \frac{1}{2}\ b\ \ h$

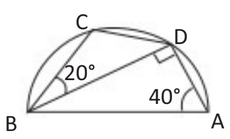
$\Delta_2 = \frac{1}{2}\ \ 2b\ \ 2h$

$\frac{\Delta_1}{\Delta_2} = \frac{\frac{1}{2}bh}{\frac{1}{2}\ 4bh} = 1:4$

$\Delta_1 : \Delta_2 = 1:4$ ***Ans: c***

2. C and D are point on the semi-circle subscribed on BA as diameter. If BAD = 40° and DBC = 20°, ABD = ?
a) 50° b) 40°
c) 60° d) 70°

Sol:

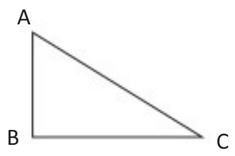


In ΔABD
∠BDA = 90°
∠ABD = 180° – (40° + 90°)
∠ABD = 50°

Ans: a

3. What will be the area of the right angle isosceles triangle whose hypotenuse is 18 cm?
a) 158 cm^2 b) 162 cm^2
c) 164 cm^2 d) 324 cm^2

Sol:

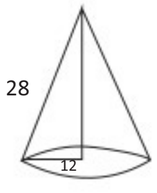


AB = BC = x
AC = $18\sqrt{2}$
$x^2 + x^2 = (18\sqrt{2})^2$
$\Rightarrow 2x^2 = 18 \times 18 \times 2$
$x = 18$
The area of triangle
= ½ × base × height
= ½ × 18 × 18 = 162 cm^2

Ans: b

4. The radius of base and slant height of a cone are in the ratio 3 : 7. If its curved surface area is 1056cm^2, then the radius (in cm) of its base is $\left(\pi = \frac{22}{7}\right)$
a) 16 b) 12
c) 18 d) 24

Sol:



$\pi rl = 1056\ cm^2$

$\frac{22}{7} \times 3x \times 7x = 1056$

$\frac{22}{7} \times 21x^2 = 1056$

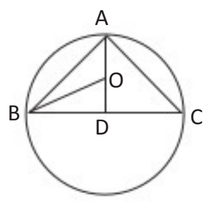
$21x^2 = \frac{1056\ \ 7}{22}$

$x^2 = \frac{1056\ \ 7}{22\ \ 21}$

$x = 4$
r = 3 × 4 = 12 cm ***Ans: b***

5. The area of an equilateral triangle, inscribed in a circle is $16\sqrt{3}\ cm^2$. The area of the circle in terms of π will be-
a) $3\frac{1}{21}\pi cm^2$ b) $13\pi cm^2$
c) $18\frac{1}{3}\pi cm^2$ d) $21\frac{1}{3}\pi cm^2$

Sol:



The area of the equilateral triangle
$= \frac{\sqrt{3}}{4}\ side^2$

$16\sqrt{3} = \frac{\sqrt{3}}{4}\ side^2$

∴side = 8 cm
∴ The height of the equilateral triangle
$= \frac{\sqrt{3}}{2}\ \ 8 = 4\sqrt{3}$ cm
The radius of the circum circle
$= \frac{2}{3}\ \ 4\sqrt{3} = \frac{8}{\sqrt{3}}$cm
∴The area of the circle
$= \pi\ \ \frac{8}{\sqrt{3}}\ \ \frac{8}{\sqrt{3}} = \frac{64}{3}\pi$
$= 21\frac{1}{3}\pi cm^2$

Ans: d

6. The distance of the point (12, –9) from the origin is -
a) 13 units b) 15 units
c) 12 units d) 17 units

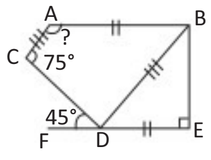
Sol: Distance
$= \pi\ \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Origin = (0, 0)
Distance
$\sqrt{(12-0)^2 + (-9-0)^2}$

$\sqrt{144+81} = \sqrt{225} = 15$ units

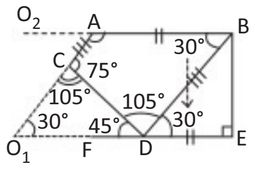
Ans: b

7. In the given figure AB||DE, AC || BD, DE ⊥ BE, ∠FDC = 45° and ∠C = 75°.



What is the measure of ∠CAB?
a) 120° b) 150°
c) 45° d) 135°

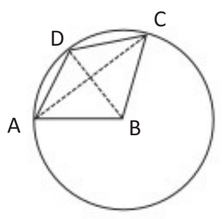
Sol:



∠OCD = 180° – 75° (linear pair)
= 105°
IN ΔOCD
∠COD = 180° – (105° + 45°)
= 30° Now,
∠COD = CAO (Alternate angle)
∠CAO = 30°
∠CAB = 180° – ∠CAO° (linear pair)
∠CAB = 150° ***Ans: b***

8. ABCD is a rhombus whose three vertices A, D and C lie on a circle while the 4th vertex B lies on its centre. If the area of rhombus is $8\sqrt{3}cm^2$. Find the radius of the circle?
a) 6 cm b) 8 cm
c) 2 cm d) 4 cm

Sol:



Let the radius of circle is 'r' cm
∴ABCD is rhombus
AB = AD = CD = BC
Now,
AB = BD = BC = radius = r cm
Thus,
ΔBCD and ΔBAD are equilateral triangles
Hence, the area of rhombus ABCD
$8\sqrt{3} = 2\ \ \frac{\sqrt{3}}{4}r^2$

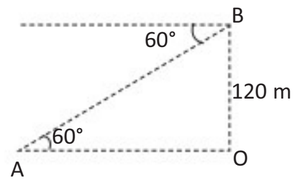
$16 = r^2$
r = 4 cm ***Ans: d***

9. The value of $\sin^2 15° + \sin^2 30° + \sin^2 45° + \sin^2 60° + \sin^2 75° + \sin^2 90°$ is –
a) $\frac{3}{2}$ b) $\frac{5}{2}$
c) $\frac{7}{2}$ d) $\frac{9}{2}$

Sol: $\sin^2 15° + \sin^2 75° + \sin^2 30° + \sin^2 60° + \sin^2 45° + \sin^2 90° = ?$
$\Rightarrow (\sin^2 15° + \cos^2 15°) + (\sin^2 30° + \cos^2 30°) + \sin^2 45° + \sin^2 90°$
= 1 + 1 + ½ + 1
$= \frac{7}{2}$ ***Ans: c***

10. From a cliff 120 m above the shore of a sea, the angle of depression of a ship is 60°. Find the distance from the ship to a point on the shore directly below the observer.
a) 40 √2 m b) 40 √3 m
c) 33 √3 m d) 50 √3 m

Sol:



$\tan 60° = \frac{BO}{OA}$

$OA = \frac{OB}{\sqrt{3}}$

$OA = \frac{120\ \ \sqrt{3}}{3}$

$OA = 40\sqrt{3}$ m

Ans: b

11. The ice compartment in a refrigerator is 18 cm deep, 6 cm high and 3 cm wide, then how many ice cubes will it hold, if each cube is 3 cm as its edge.
a) 10 b) 8
c) 12 d) 9

Sol: The volume of ice compartment
$= 18 \times 6 \times 3 = 324\ cm^3$
The volume of one ice cube
$= (3)^3 = 27\ cm^3$
So, Required number of cubes
$= \frac{324}{27} = 12$ ***Ans: c***

12. The sides of a triangle are 5, 13 and 10 cm. the radius of its incircle is –
a) $4\sqrt{2}$ cm b) $3\sqrt{2}$ cm
c) $\frac{3\sqrt{2}}{7}$cm d) $\frac{3\sqrt{14}}{7}$cm

Sol: $S = \frac{a+b+c}{2} = \frac{5+13+10}{2} = 14$

$\Delta = \sqrt{S(S-a)(S-b)(S-c)}$

$= \sqrt{14(9)(1)(4)} = 6\sqrt{14}$

$r = \frac{\Delta}{s} = \frac{6\sqrt{14}}{14}$

$r = \frac{3\sqrt{14}}{7}$cm

Ans: d

13. A boat goes 8 kms an hour in still water, but takes twice as much time in going the same distance against the current. The speed of the current (in km/hr) is –
a) 2 km/hr b) 4 km/hr
c) 3 km/hr d) 5 km/hr

Sol: Let the speed of the current be x km/h

$\frac{8}{8-x} = 2$

$8 = 16 - 2x$

$2x = 8$

$x = 4$ km/hr ***Ans: b***

14. If $a^2 + b^2 = 121$ and ab = 52, then value of $\frac{a+b}{a-b}$ is –
a) 0 b) 13
c) $\frac{15}{\sqrt{17}}$ d) $\frac{13}{\sqrt{17}}$

Sol:

$\frac{a+b}{a-b} = \sqrt{\frac{a^2+b^2+2ab}{a^2+b^2-2ab}}$

$\frac{a+b}{a-b} = \sqrt{\frac{121+2(52)}{121-2(52)}} = \sqrt{\frac{225}{17}} = \frac{15}{\sqrt{17}}$

Ans: c

15. A wooden box measures 18 cm × 16 cm × 12 cm. Thickness of wood is 1 cm. How much volume of wood is required to make the box (in cubic cm)?
a) 1188 cm^3 b) 1388 cm^3
c) 1216 cm^3 d) 1186 cm^3

Sol: The external dimensions of the box are length = 18 cm, Breadth = 16 cm
Height = 12 cm
External volume of the box
$= 18 \times 16 \times 12\ cm^3$
$= 3456\ cm^3$
Thickness of wood = 1cm
Internal length, breadth and height = (18–2),(16–2) & (12–2)
= 16, 14 and 10 cms
∴ Internal volume
$= 16 \times 14 \times 10 = 2240\ cm^3$
∴The volume of the wood
$= (3456 - 2240)\ cm^3$
$= 1216\ cm^3$

Ans: c