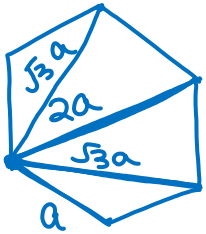
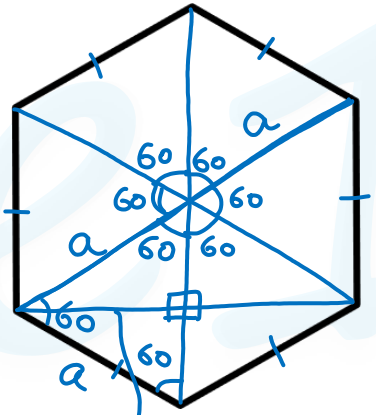
# Hexagon (षट्भुज):

Regular

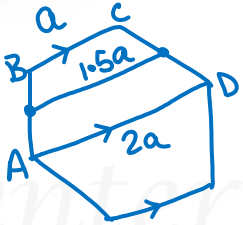


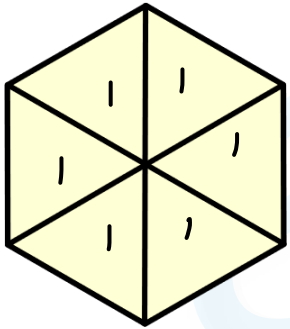

$$Area = 6 \times \frac{\sqrt{3}}{4} a^2$$

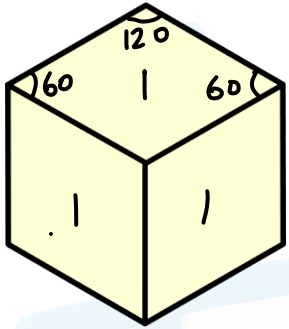
$$Peri. = 6a$$

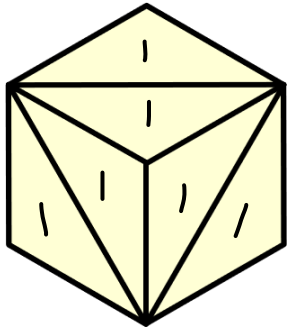
$$Dia. = \sqrt{3}a, 2a$$



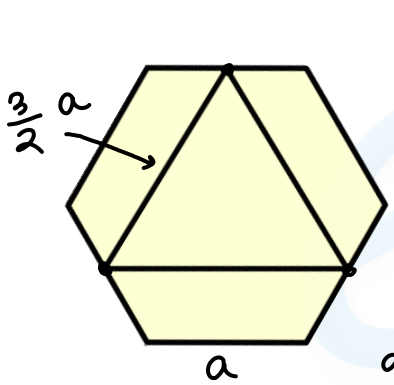
# Hexagon Area Division (षट्भुज का क्षेत्रफल विभाजन):

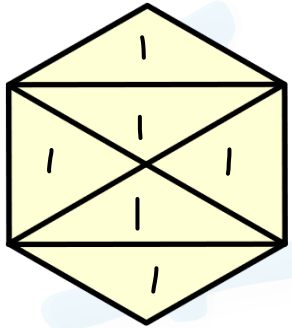


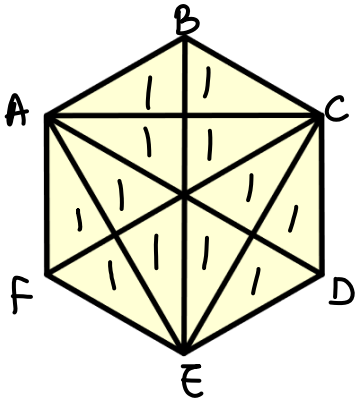


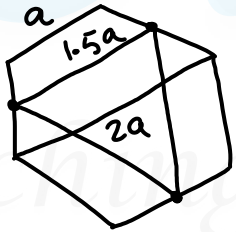



# Hexagon Area Division (षट्भुज का क्षेत्रफल विभाजन):





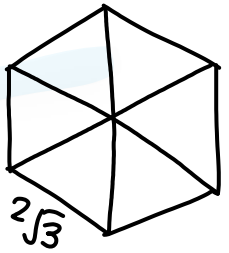
J. The area of a regular hexagon of side $2\sqrt{3}$ cm is

$2\sqrt{3}$ cm भुजा वाले सम षटकोण का क्षेत्रफल पता करो|

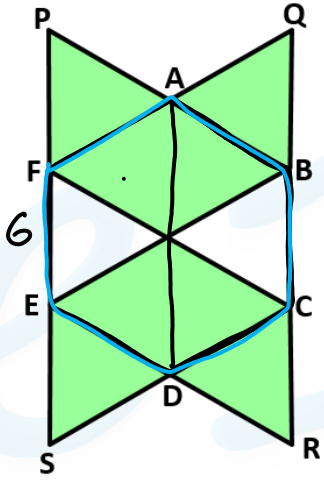
a) $3\sqrt{3}$ b) $6\sqrt{3}$

c) $12\sqrt{3}$ ~~d) $18\sqrt{3}$~~

$$6 \times \frac{\sqrt{3}}{4} \times 4 \times 3$$



$$2$$
$$8 \times \frac{\sqrt{3}}{4} \times 36$$

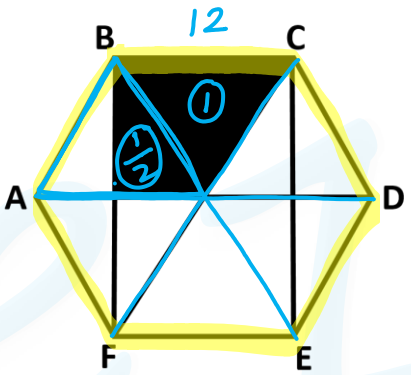



2. In the given figure, ABCDEF is a regular hexgon whose side is 6 cm. $APF$, $QAB$, $DCR$ and $DES$ are equilateral triangles. What is the area (in $cm^2$) of the shaded region?

दी गई आकृति में, $ABCDEF$ एक सम षट्भुज है जिसकी भुजा 6 cm है| $APF, QAB, DCR$ तथा $DES$ समबाहु त्रिभुज है| अछादित भाग का क्षेत्रफल ($cm^2$ में) क्या है?

a) $23\sqrt{3}$
b) $18\sqrt{3}$
c) $72\sqrt{3}$
d) $36\sqrt{3}$

SSC CGL T2, 17 feb 2018



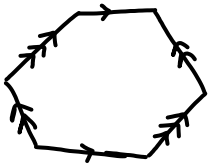

$\frac{3}{2} \times \frac{\sqrt{3}}{4} \times 12 \times 12$ (3, 6)

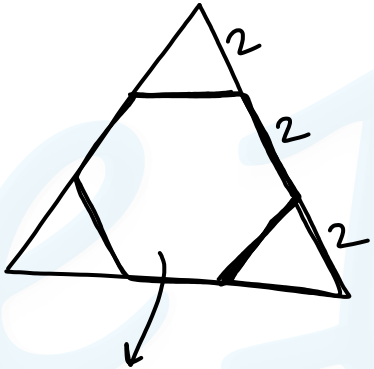
3. In the given figure, $ABCDEF$ is a regular hexagon whose side is 12cm. What is the shaded area (in $cm^2$)?
दी गई आकृति में, $ABCDEF$ एक सम षट्भुज है जिसकी भुजा 12 cm है| अच्छादित भाग का क्षेत्रफल ($cm^2$ में) क्या है?

a) $54\sqrt{3}$
b) $36\sqrt{3}$
c) $48\sqrt{3}$
d) $52\sqrt{3}$



SSC CGL T2, 9 mar, 2018



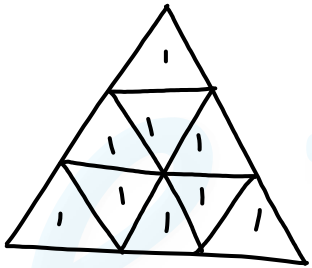



५. An equilateral triangle of sides 6 cm has its corner cut off to form a regular hexagon. Area of this regular hexagon will be

किसी 6 cm भुजा वाले सम चतुर्भुज के किनारों को इस प्रकार काटा जाता है कि ये एक सम षटकोण बन जाए| इस षटकोण का क्षेत्रफल पता करें|

a) $9\sqrt{3}$ b) $54\sqrt{3}$

c) $\sqrt{3}$ ~~d) $6\sqrt{3}$~~



$$\frac{h}{\Delta} = \frac{6}{9} = \frac{2}{3}$$

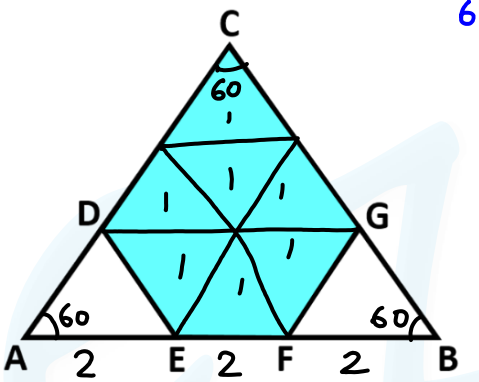
5. An equilateral triangle has area $300cm^2$. Its corners are cut off to from a regular hexagon. Area of hexagon is what percent of the area of triangle?

एक समबाहु त्रिभुज का क्षेत्रफल $300cm^2$ है| इसके तीन कोनों को काटकर एक समषट्भुज बना दिया काटा जाता है| षट्भुज का क्षेत्रफल त्रिभुज के क्षेत्रफल का कितना प्रतिशत है?

a) $66.66\%$ b) $33.33\%$
c) $83.33\%$ d) $56.41\%$



SSC CGL T2 19 Feb 2018



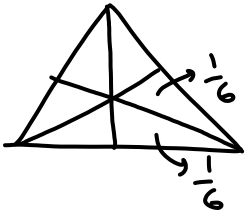

$7 \times \frac{\sqrt{3}}{4} \times 4$

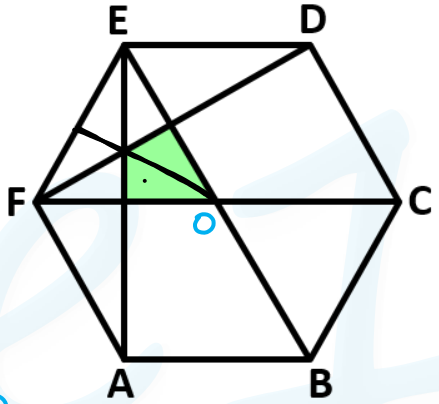
6. In the given figure ABC is a triangle in which CDEFG is a pentagon. ΔADE and ΔBFG are equilateral triangles each with side 2 cm and EF =2cm. Find the area of the pentagon:

दी गई आकृति में ABC एक त्रिभुज है और CDEFG एक पंचभुज है| Δ ADE और Δ BFG समबाहु त्रिभुज है जिनकी भुजाये 2 cm है और EF=2 cm है पंचभुज का क्षेत्रफल बताए|

a) $8\sqrt{3}cm$ b) $7\sqrt{3}cm^2$

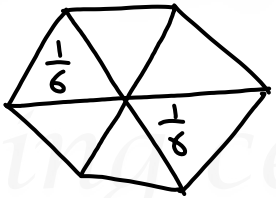
c) $15\sqrt{3}cm^2$ d) 11.28cm²




F of E

$180 \times \frac{1}{6} \times \frac{1}{3} = 10$

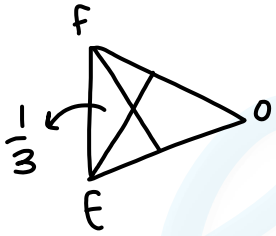



7. ABCDEF is a regular hexagon whose area is 180cm². Find the area of shaded region?

ABCDEF एक समषट्भुज है जिसका क्षेत्रफल 180cm² है| छायांकित भाग का क्षेत्रफल ज्ञात करें?

a) 9cm²  b) 10cm²

c) 12cm²  d)15cm²



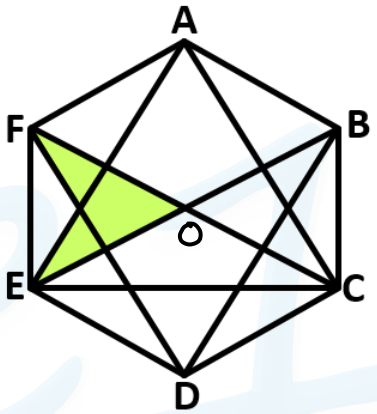

FOE

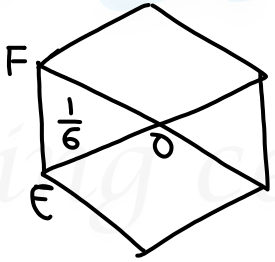
hexagon × $\frac{1}{6}$ × $\frac{2}{3}$ = Shaded

$\frac{1}{3}$

Unshaded $\frac{1}{9}$ = $\frac{\text{Shaded}}{\text{hexa}}$

8 ← 9




$\frac{1}{6} \times \frac{2}{3} = \frac{1}{9}$ → 8

8. **In the given figure, ABCDEF is a regular hexagon. Find the ratio of shaded area to unshaded area?**

**दिए गए चित्र में, ABCDEF एक सम षट्भुज है| छायांकित और शेष भाग के क्षेत्रफल का अनुपात ज्ञात करे?**

a) $\frac{1}{8}$ b) $\frac{1}{9}$

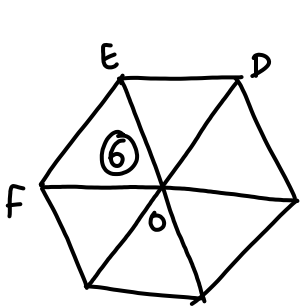
c) $\frac{1}{12}$ d) $\frac{1}{12}$

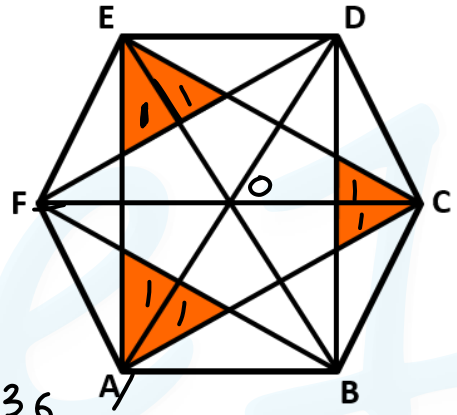
9. **In the given figure, ABCDEF is a regular hexagon, and all the possible diagonals are drawn. What percent of the area of the hexagon is shaded?**

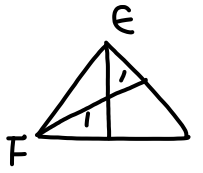
**दी गई आकृति में, ABCDEF एक सम षट्भुज है, जिसमे सभी संभावित विकर्ण खींच दिए गए हैं| षट्भुज का कितना प्रतिशत क्षेत्रफल छायांकित है?**

~~a)~~ 16.66%  b) 33.33%

c) 25%  d) 20%



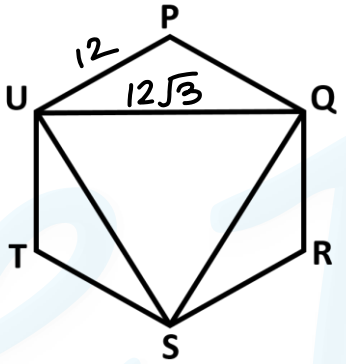




hexa = 36

Shaded = 6

$\frac{6}{36} = \frac{1}{6}$




$\frac{\sqrt{3}}{4} \times 12 \times 12 \times 3$

10. In the given figure, $PQRSTU$ is a regular hexagon of side 12 cm. What is the area (in $cm^2$) of triangle SQU?

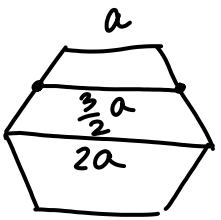
दी गई आकृति में, $PQRSTU$ एक समषट्भुज है जिसकी भुजा 12cm है| त्रिभुज SQU का क्षेत्रफल ($cm^2$ में ) क्या है?

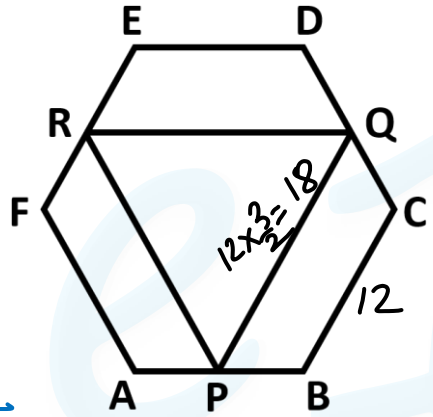
a) $162\sqrt{3}$ b) $216\sqrt{3}$

c) $108\sqrt{3}$ d) $54\sqrt{3}$



SSC CGL T2 19 Feb 2018



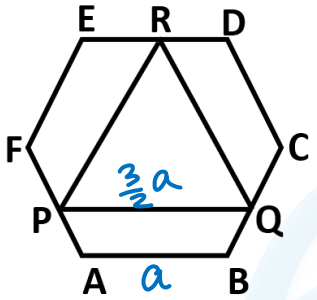



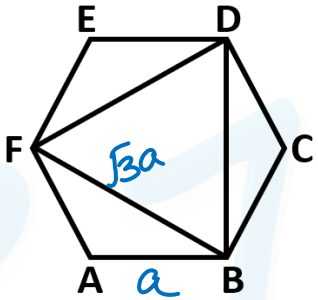

$\frac{\sqrt{3}}{4} \times 18 \times 18$ (9 9)

II. In the given figure, ABCDEF is a regular hexagon of side 12cm P, Q and R are the mid points of the sides AB, CD and EF respectively. What is the area (in $cm^2$) of triangle PQR?

दी गई आकृति में, ABCDEF एक सम षट्भुज है जिसकी भुजा 12cm है| P, Q तथा R क्रमश: भुजाओ AB, CD तथा EF के मध्य बिंदु है| त्रिभुज PQR का क्षेत्रफल ($cm^2$ में) क्या है?

a) $27\sqrt{6}$
b) $81\sqrt{3}$
c) $54\sqrt{3}$
d) $54\sqrt{6}$




Sides $\frac{\sqrt{3}}{2}a : \sqrt{3}a$

$\sqrt{3} : 2$

Area $3 : 4$

12. In the given figure there are two congruent regular hexagons each with side 6cm. What is the ratio of area of $\Delta BDF$ and $\Delta PQR$, if P, Q and R are the mid-points of side AF, BC and DE?

दी गई आकृति में दो सर्वांगसम समषटकोण है जिनकी भुजाये 6 cm की है तो $\Delta BDF$ और $\Delta PQR$ के क्षेत्रफल का अनुपात बताए, अगर P, Q और R भुजा AF, BC और DE के मध्य बिंदु है?

a) 6:5 b) 7:6

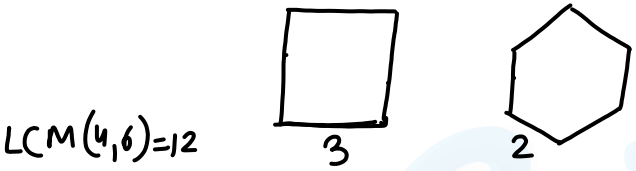
c) 4:3 d) 1:1

13. The perimeters of a square and a regular hexagon are equal. The ratio of the area of the hexagon to the area of the square is

एक वर्ग और एक सम षटकोण के परिमाप बराबर हैं| षटकोण और वर्ग के क्षेत्रफलों का अनुपात क्या होगा?

a) $2\sqrt{3}:3$ b) $\sqrt{3}:1$

c) $3\sqrt{3}:2$ d) $\sqrt{2}:3$



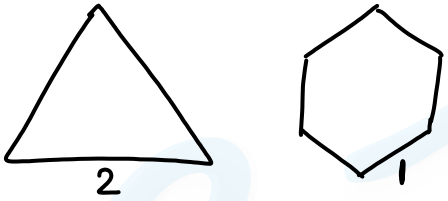

$$\frac{h}{S} = \frac{6 \times \sqrt{3} \times 4}{4 \times 9} = \frac{2\sqrt{3}}{3}$$

14. An equilateral triangle and a regular hexagon have equal perimeters. If the area of the triangle is $16\ cm^2$, then the area of the hexagon is

एक सम त्रिभुज और एक सम षटकोण के परिमाप बराबर हैं| अगर त्रिभुज का क्षेत्रफल $16\ cm^2$ है तो षटकोण का क्षेत्रफल पता करें|

a) $16cm^2$ b) $24\ cm^2$

c) $32\ cm^2$ d) $27\ cm^2$




$$\frac{T}{h} = \frac{\frac{\sqrt{3}}{4} \times 4}{6 \times \frac{\sqrt{3}}{4} \times 1} = \frac{2}{3}$$

$\times 8 \rightarrow 16$

$\times 8 \rightarrow ?$

15. The area of a regular hexagon is equal to the area of the square. What is the ratio of the perimeter of the regular hexagon to the perimeter of square?

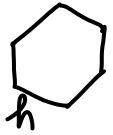
सम षट्भुज का क्षेत्रफल वर्ग के क्षेत्रफल के बराबर है| सम षट्भुज के परिमाप का वर्ग के परिमाप से क्या अनुपात है?

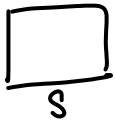
a) $\sqrt{6\sqrt{3}} : \sqrt{3\sqrt{6}}$

b) $2\sqrt{3} : \sqrt{6\sqrt{2}}$

c) $\sqrt{6\sqrt{3}} : 2$

d) $\sqrt{6\sqrt{3}} : 2\sqrt{3}$




$8 = \sqrt{64}$

$6 \times \frac{\sqrt{3}}{4} h^2 = s^2$

$\frac{h^2}{s^2} = \frac{4}{6\sqrt{3}}$

$\Rightarrow \frac{h}{s} = \sqrt{\frac{2}{3\sqrt{3}}} \Rightarrow \frac{6h}{4s} = \sqrt{\frac{2 \times 36}{3\sqrt{3} \times 16}} = \sqrt{\frac{\sqrt{3}}{2}}$

$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

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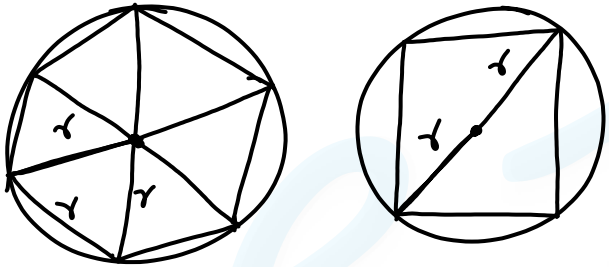



$3\ 6 \times \frac{\sqrt{3}}{4} \times r^2 : \frac{1}{2} \times 4 \times r^2$

16. A square and a regular hexagon are drawn such that all the vertices of the square and the hexagon are on a circle of radius r cm. The ratio of area of the square and the hexagon is

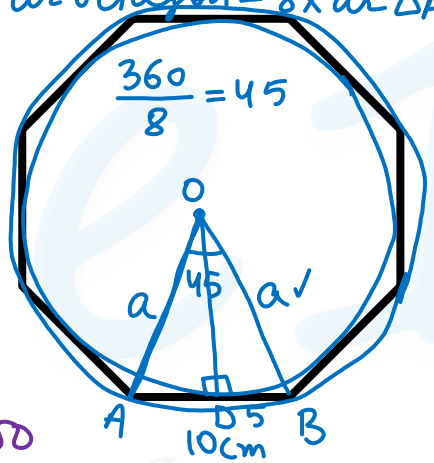
एक वर्ग और एक सम षटभुज इस प्रकार बनाए गए हैं कि वर्ग और षटभुज के सभी शीर्ष r से. मी. त्रिज्या वाले वृत्त पर है । वर्ग और षटभुज के क्षेत्रफलों का अनुपात बताइए ?

a) 3 : 4
b) $4 : 3\sqrt{3}$
c) $\sqrt{2} : \sqrt{3}$
d) $1 : \sqrt{2}$



SSC CGL T2 1 Dec 2016

# Octagon (अष्टभुज):




ar Δ AOB

$= \frac{1}{2} a^2 \sin 45$

$= \frac{1}{2} \times \frac{100}{2-\sqrt{2}} \times \frac{1}{\sqrt{2}}$

Cosine Rule:

$2a^2 - 2a^2 \frac{1}{\sqrt{2}} = 100$

$\Rightarrow a^2 = \frac{100}{2-\sqrt{2}}$

$$\textbf{Area} = 8 \times \frac{1}{2} \times \frac{100}{2-\sqrt{2}} \times \frac{1}{\sqrt{2}}$$

$$\textbf{Peri.} = 8 \times 10 = 80 \text{ cm}$$

$r = \checkmark$

$R = \checkmark$