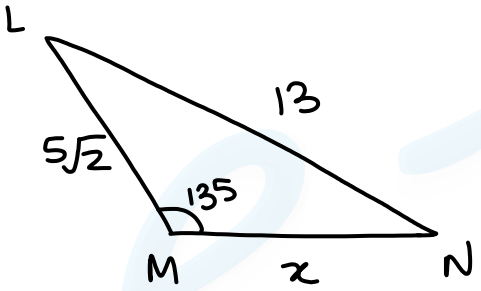
16. In ΔLMN, $LM = 5\sqrt{2}\ cm, LN = 13\ cm$ and $\angle LMN = 135°$. What is the length (in cm) of MN?

ΔLMN में, $LM = 5\sqrt{2}\ cm, LN = 13\ cm$ और $\angle LMN = 135°$ हैं| MN की लंबाई (cm में) कितनी है?

a) $7\sqrt{2}$ b) 8

c) 7 d) $8\sqrt{2}$

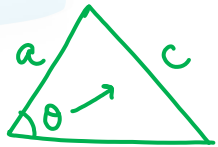


$169 = 50 + x^2 - 10\sqrt{2}\,x \times \frac{-1}{\sqrt{2}}$ Cos135

$\Rightarrow x^2 + 10x - 119 = 0$

-10

$-17 \times$ 7 ✓

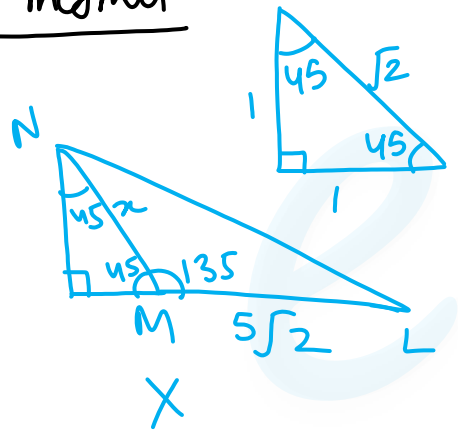


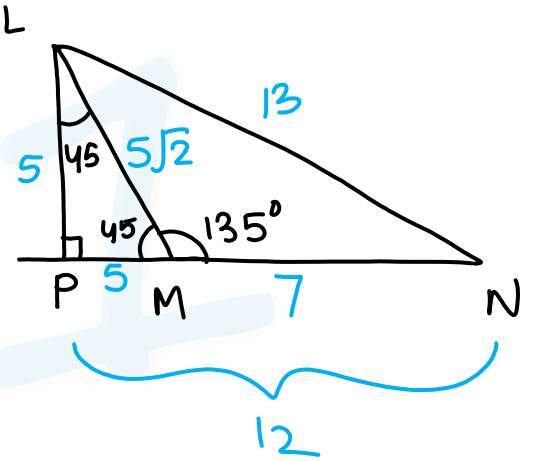
$\cos 135° = -\frac{1}{\sqrt{2}}$

$c^2 = a^2 + b^2 - 2ab\cos\theta$

coaching centers

2nd method



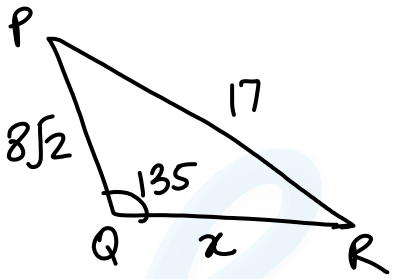


coaching center

17. In ΔPQR, $\angle PQR = 135°, PQ = 8\sqrt{2}cm$ and $PR = 17cm$. What is the length (in cm) of QR?

ΔPQR में, $\angle PQR = 135°$ है, $PQ = 8\sqrt{2}cm$ और $PR = 17cm$ है | QR की लम्बाई (cm में) ज्ञात करें |

a) 7 b) 10 c) 8 d) 9



Cos135

$289 = 128 + x^2 - 16\sqrt{2} \times x \times -\frac{1}{\sqrt{2}}$

$\Rightarrow x^2 + 16x - 161 = 0$

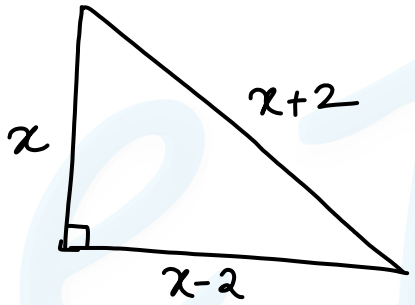
-16 -23 7

coaching center

18. The length of three sides of a right-angled triangle are $x-2\ cm$, $x\ cm$ and $x+2\ cm$ respectively. Then the value of x is

किसी समकोण त्रिभुज की तीनों भुजाएं क्रमवार $x-2\ cm, x\ cm$ और $x+2\ cm$ हैं तो x का मान ज्ञात करें|

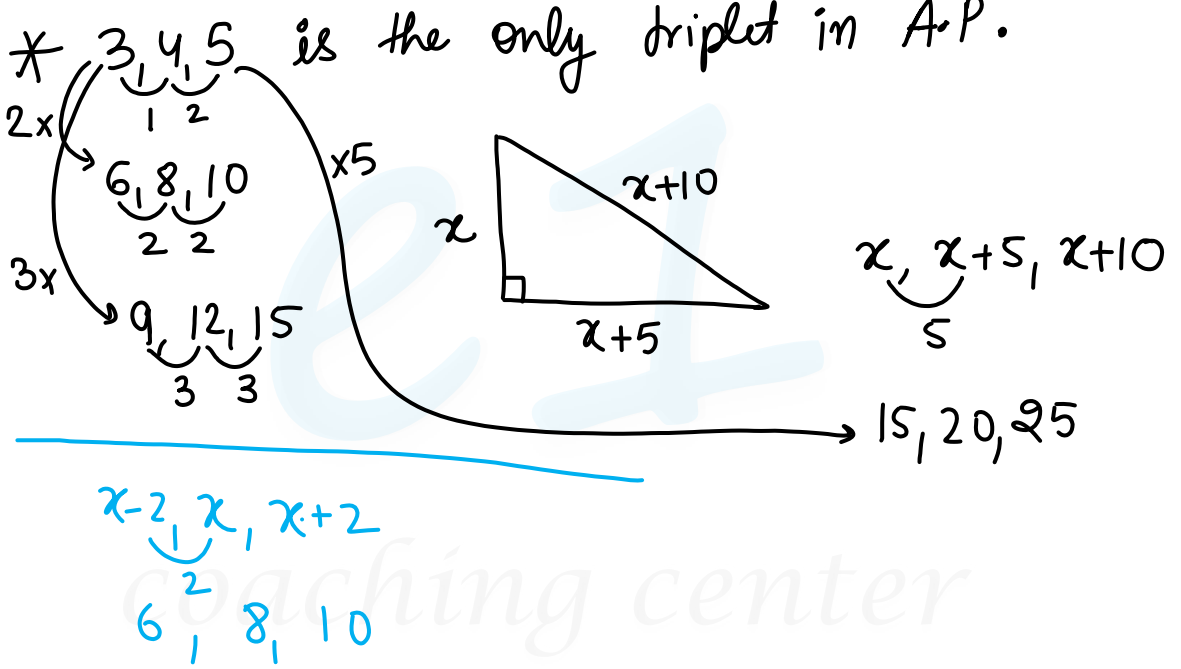
a) 10 b) 8 c) 4 d) 6



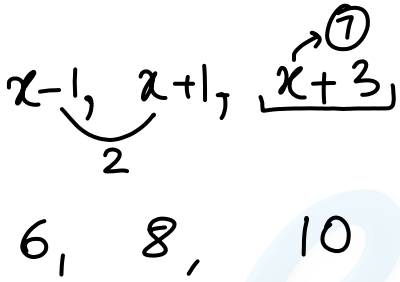
$x^2+4x+4 = x^2+x^2-4x+4$

$\Rightarrow x^2-8x=0$

$\Rightarrow x(x-8)=0 \rightarrow x=0,8$



coaching center



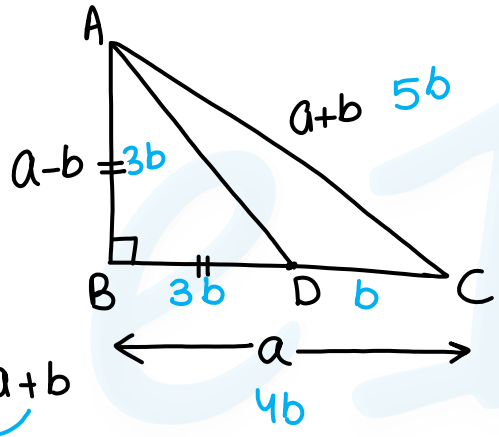
19. The lengths of the three sides of a right-angled triangle are $(x-1)\ cm$, $(x+1)\ cm$ and $(x+3)\ cm$, respectively. The hypotenuse of the right-angled triangle $(in\ cm)$ is :

एक समकोण त्रिभुज की तीनों भुजाओं की लम्बाई क्रमशः $(x-1)cm$, $(x+1)cm$ और $(x+3)cm$ है| समकोण त्रिभुज के कर्ण की लम्बाई (cm में) कितनी होगी?

a) 6 b) 10

c) 12 d) 7

coaching center



a-b, a, a+b

+b +b

3, 4, 5

3b, 4b, 5b

20. ABC is a right-angled triangle such that $AB = a - b, BC = a$ and $CA = a + b$. D is a point on BC such that $BD = AB$. The ratio of $BD : DC$ for any value of a and b is given by

largest

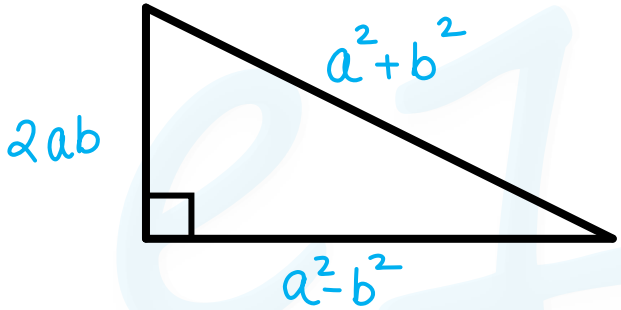
ABC एक समकोण त्रिभुज इस प्रकार है कि $AB = a - b, BC = a$ और $CA = a + b$ है| बिंदु D भुजा' BC पर इस प्रकार है कि $BD = AB$ है| a और b के किसी मान के लिए $BD : DC$ का अनुपात क्या होगा?

a) 3:2 b) 4:3

c) 5:4 d) 3:1

coaching center

Pythagorean triplets basic format:



$a=2, b=1 \Rightarrow 3, 4, 5$

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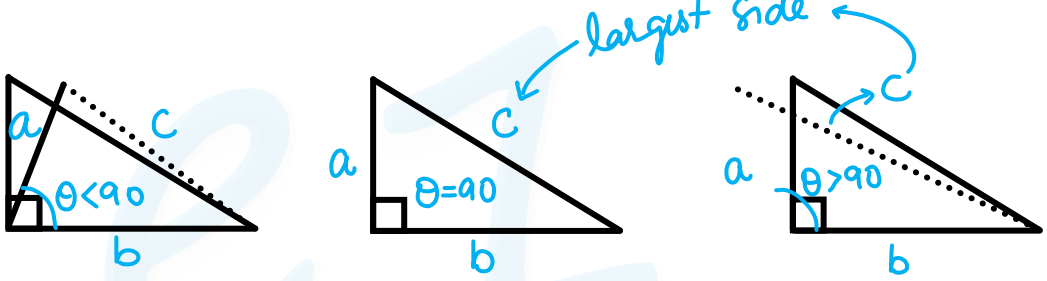
Pythagoras-cousin theorem:



$c^2 = a^2 + b^2$, when $\theta = 90$

$c^2 > a^2 + b^2$, when $\theta > 90$

$c^2 < a^2 + b^2$, when $\theta < 90$

coachingcenter

$36 \quad 9+16$

$36 > 25$

21. The sides of a triangle are in ratio 3 : 4 : 6. The triangle is
a) Acute angled
b) Right angled
c) Obtuse angled
d) Equilateral

किसी त्रिभुज की भुजाओं की लम्बाई 3:4:6 के अनुपात में है| तो वह त्रिभुज है:
a) न्यून कोण
b) सम कोण
c) अधिक कोण
d) समबाहु

e1 coaching center

22. The angles of a triangle are in the ratio 3 : 4 : 5. the triangle is
a) Obtuse angled triangle
b) Right angled triangle
c) Acute angled triangle
d) Isosceles angled triangle

एक त्रिभुज के कोण 3 : 4 : 5 के अनुपात में है| त्रिभुज है:
a) अधिककोण त्रिभुज
b) समकोण त्रिभुज
c) न्यूनकोण त्रिभुज
d) समद्विबाहु कोण त्रिभुज

15
180
12
x15
45, 60, 75

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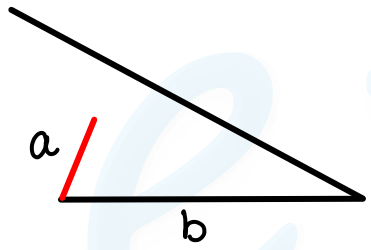
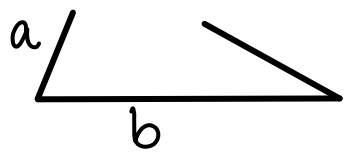
SSC CHSL 15 Oct 2020 S2

Range of length of third side:



3rd < Sum of a+b



3rd > diff of a+b

$|a-b| < 3^{rd} < a+b$

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10. Which of the following options does NOT give the lengths of three sides of any triangle?

निम्नलिखित में से कौन सा विकल्प किसी त्रिभुज की तीन भुजाओं की लंबाई नहीं देता है?

a) 12, 18, 25

b) 4, 7, 9

c) 18, 23, 41

c) 7, 10, 12

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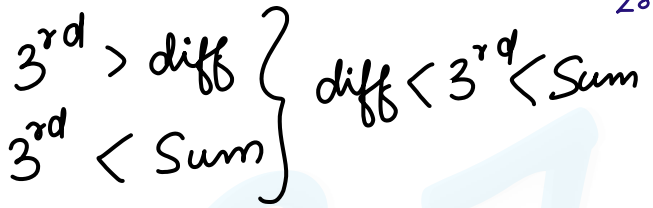
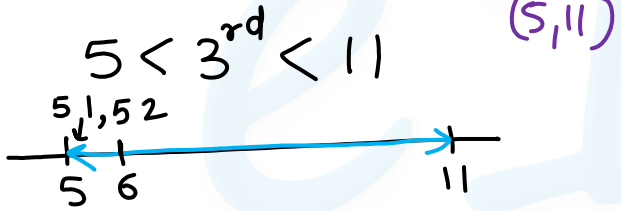
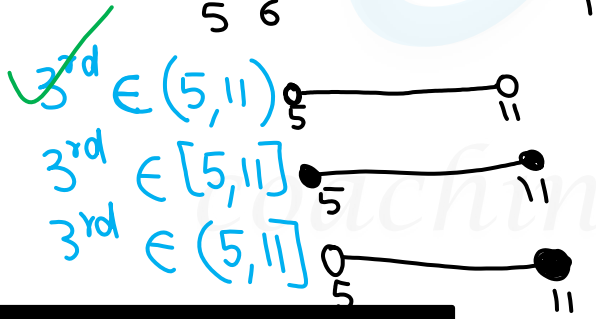
SSC CHSL, 3 June 2022 S3







2. Two sides of a triangle are 3 cm and 8 cm. Which of the following cannot be the length of the third side

किसी त्रिभुज की दो भुजाये 3 cm और 8 cm हैं| निम्न में से कौनसी तीसरी भुजा की लम्बाई नहीं हो सकती?

i) 9 ii) 10
iii) 5 iv) 8
v) 12

a) i) and iii) b) Only iii)
c) Only v) d) iii) and v)

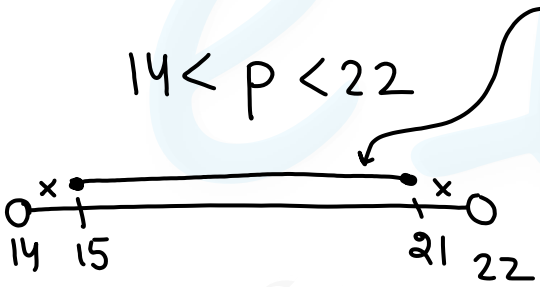
e1 teaching center

3rd ∈ (3, 11)

3 11

Perimeter ∈ (14, 22)

14 < p < 22



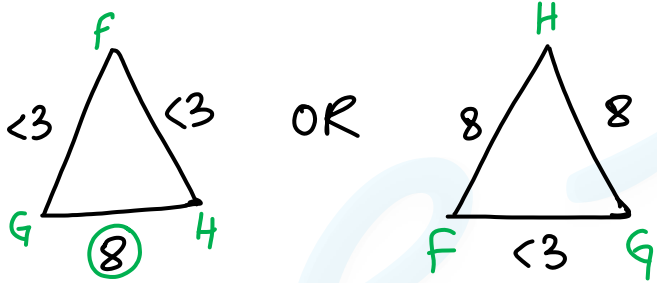
3. Two sides of a triangle are 4 cm and 7 cm. If perimeter of this triangle is denoted by p then

किसी त्रिभुज की दो भुजाये 4cm और 7cm हैं| अगर इस त्रिभुज के परिमाप को p से दर्शाया जाए तो :

a) $15 \leq p \leq 21$ b) $14 \leq p \leq 22$

c) $14 < p < 22$ d) $15 < p < 21$

coaching center



$0 < 8 < 6$ ✗

4. In isosceles triangle △FGH, $FG < 3cm$ and $GH = 8cm$. Then the correct relation is, समद्विबाहु

किसी त्रिभुज FGH में $FG < 3\ cm$ और $GH = 8\ cm$. तो सही सम्बन्ध बताएं|

a) GH=FH b) GH<FH

c) GF=GH d) FH>GH

coaching center

SSC CGL T1, 27 Apr 2014

$x \in (7, 23) = [8, 22]$ $8^2+15^2=17^2$

If largest = 15

$225 > x^2+64$

$\Rightarrow x^2+64 < 225$

$\Rightarrow x^2 < 161$

$\Rightarrow x < \sqrt{161} = 12.\sim$

$x \in [8, 12]$ 5 values

8, 15, 8
9
10
12

If largest = x

$x^2 > 8^2+15^2$

$x^2 > 17^2$

$x > 17$

$x \in [18, 22]$

8, 15, 18
8, 15, 19
5 values

5. Consider obtuse-angled triangles with sides 8 cm, 15 cm and x cm. if x is an integer, then how many such triangles exist?

एक अधिककोण त्रिभुज की भुजाओं की लम्बाई 8 cm, 15 cm और x cm है| अगर x एक पूर्णांक है तो इस तरह के कितने त्रिभुज बनाये जा सकते हैं?

a) 5 b) 21
c) 10 d) 15 e) 14

CAT 2008

Triangle → P (4, 26) = [5, 25]

11, 15, P largest

largest = 15

$225 > P^2 + 121$

$P^2 < 104$

$P < \sqrt{104} = 10.\sim$

P [5, 10] (6)

largest = P

$P^2 > 121 + 225$

$\Rightarrow P^2 > 346$

$\Rightarrow P > \sqrt{346} = 18.\sim$

$\Rightarrow$ P [19, 25] (7)

6. The sides of an obtuse angled triangle are 11, 15 and P (integer). How many values of 'P' are possible?

11, 15 व P (पूर्णांक संख्या) अधिक कोण त्रिभुज की भुजाये हैं| P के कितने मान संभव है|

a) 7 b) 12

c) 13 d) 14

7. x, y, z are integer that are side of an obtuse-angled triangle. If $xy = 4$, find z.

x, y, z पूर्णांक हैं जो एक अधिक कोण त्रिभुज की भुजा हैं। यदि $xy = 4$, $z = ?$

a)2 b)3 c)1 d)More than one possible value

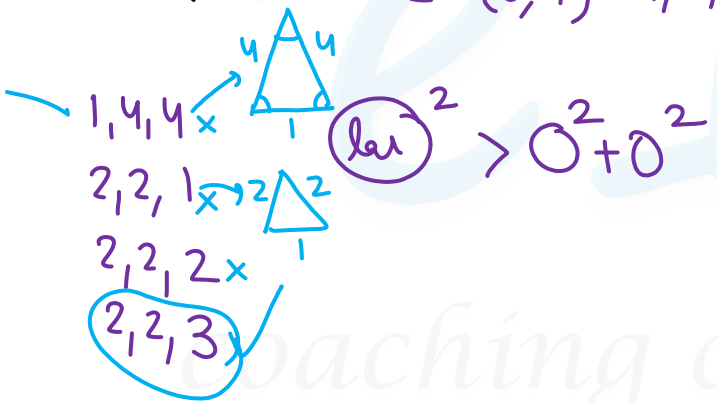
$x\ y = 4$

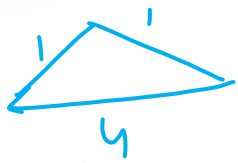
1 4

2 2

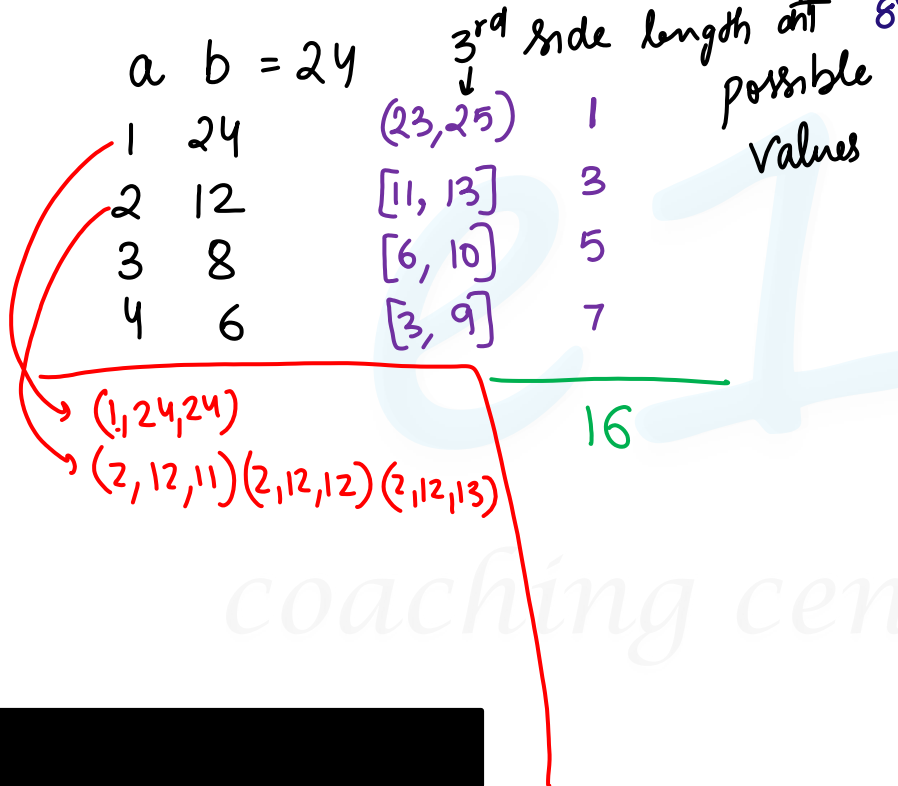
$z = (3, 5) = 4$

$z = (0, 4) = 1, 2, 3$





coaching center



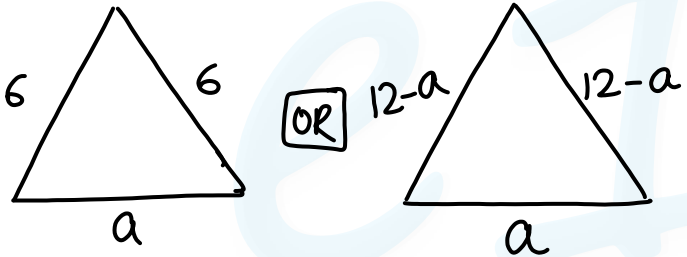
8. If a and b are the lengths of two sides of a triangle such that the product $ab = 24$, where a and b are integers, the how many such triangles are possible?

यदि किसी त्रिभुज की दो भुजाओं की लंबाई a और b इस प्रकार है कि गुणनफल $ab = 24$ है, जहां a और b पूर्णांक है, तो ऐसे संभावित त्रिभुजों की संख्या ज्ञात करें|

a) 15 b) 12
c) 18 d) 16

SSC CHSL,12 Apr 2021 S3

Either Sum of equal sides = 12 OR Sum of one equal & unequal side = 12



$a > 0$, $a < 12$ $\Rightarrow$ $[1, 11]$ $\Rightarrow$ 11

$a > 0$ & $a < 24 - 2a$ $\Rightarrow$ $3a < 24$ $\Rightarrow$ $a < 8$ $\Rightarrow$ $[1, 7]$ $\Rightarrow$ 7

Equilateral is always counted twice $11 + 7 - 1 = 17$

Q. How many isosceles triangles with integer sides are possible such that sum of two of the side is 12?

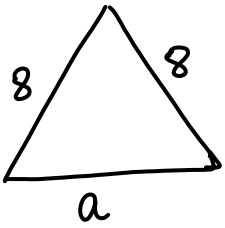
पूर्णांक भुजाओं के साथ कितने समद्विबाहु त्रिकोण संभव हैं जिसमें दो भुजाओं का योग 12 है?

a) 11 b) 16

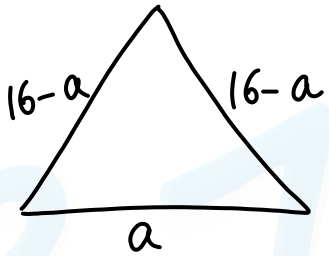
c) 17 d) 18

10. How many isosceles triangles with integer sides are possible such that the sum of two of the sides is 16 cm?
पूर्णांक भुजाओं वाले ऐसे कितने समद्विबाहु त्रिभुज संभव हैं जिनमें दो भुजाओं का योग 16 cm हो?

a) 18 b) 15
c) 9 d) 24



OR



$a \in [1,15]$

15 values

$a > 0$ &

$\Rightarrow a < 32 - 2a$

$\Rightarrow 3a < 32$

$\Rightarrow a < 10.66$

$[1,10]$ 10 values

(8,8) is counted in both

15 HO − 1 =

coaching center

length of any side < Sum of other 2 sides

largest = 6.5 < $\frac{S_1 + S_2}{6.5}$

largest < $\frac{Per}{2} = \frac{13}{2} = 6.5$

$\frac{13}{2} = 6.5$

maximum possible value of largest side = 6

a	≥	b	≥	c
6		6		1
6		5		2
6		4		3
		3		4

a	≥	b	≥	c
5		5		3
		4		4
4		5		4

11. The perimeter of a triangle with sides of integer values is equal to 13. How many such triangles are possible?
पूर्णांक मानों की भुजाओं वाले त्रिभुज का परिमाप 13 के बराबर है| ऐसे कितने त्रिभुज बनना संभव है?

a) 5 b) 8
c) 7 d) 6

coaching center

largest side $< \frac{17}{2} = 8.5$

Perimeter = 17

a	≥	b	≥	c
8		8		1
		7		2
		6		3
		5		4
7		7		3
		6		4
		5		5
6		6		5
5		5		7

coaching center