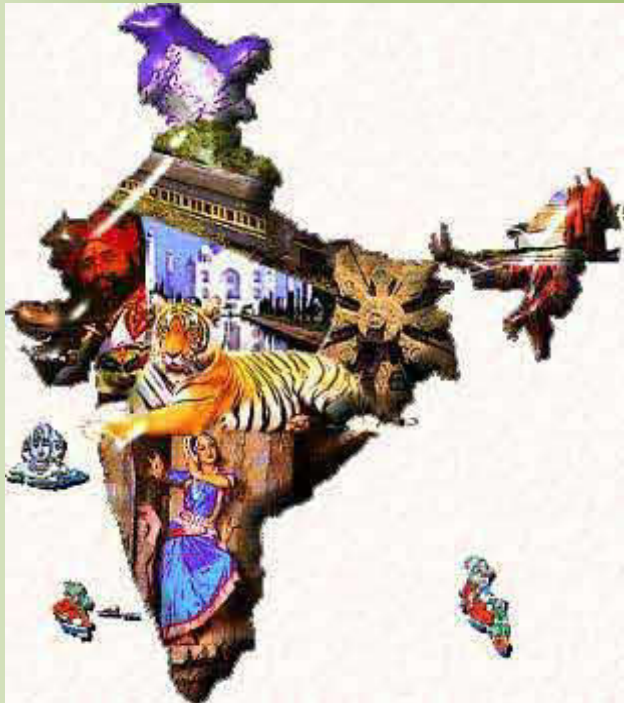




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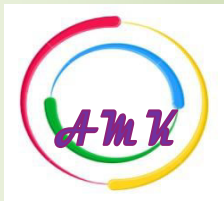


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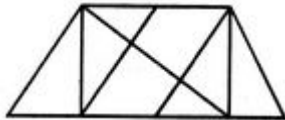


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Analytical reasoning

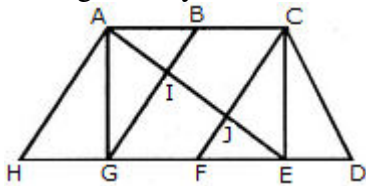
1. Find the number of triangles in the given figure.



- A. 8
- B. 10
- C. 12
- D. 14

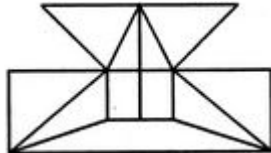
Answer: Option D

The figure may be labelled as shown.



The simplest triangles are AHG, AIG, AIB, JFE, CJE and CED i.e. 6 in number.
 The triangles composed of two components each are ABG, CFE, ACJ and EGI i.e. 4 in number.
 The triangles composed of three components each are ACE, AGE and CFD i.e. 3 in number.
 There is only one triangle i.e. AHE composed of four components.
 Therefore, There are $6 + 4 + 3 + 1 = 14$ triangles in the given figure.

2. Find the minimum number of straight lines required to make the given figure.

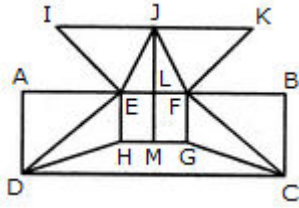


- A. 16
- B. 17
- C. 18
- D. 19

Answer: Option B

Explanation:

The figure may be labelled as shown.



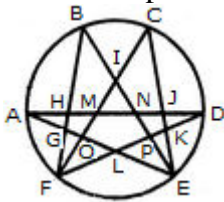
The horizontal lines are IK, AB, HG and DC i.e. 4 in number.
 The vertical lines are AD, EH, JM, FG and BC i.e. 5 in number.
 The slanting lines are IE, JE, JF, KF, DE, DH, FC and GC i.e. 8 is number.
 Thus, there are $4 + 5 + 8 = 17$ straight lines in the figure.

3. Find the number of triangles in the given figure.



- A. 22
- B. 24
- C. 26
- D. 28

Answer: Option D.



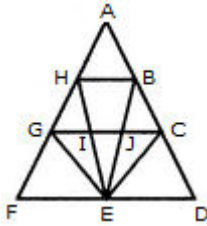
The simplest triangles are AGH, GFO, LFO, DJK, EKP, PEL and IMN i.e. 7 in number.
 The triangles having two components each are GFL, KEL, AMO, NDP, BHN, CMJ, NEJ and HFM i.e. 8 in number.
 The triangles having three components each are IOE, IFP, BIF and CEI i.e. 4 in number.
 The triangles having four components each are ANE and DMF i.e. 2 in number.
 The triangles having five components each are FCK, BGE and ADL i.e. 3 in number.
 The triangles having six components each are BPF, COE, DHF and AJE i.e. 4 in number.
 Total number of triangles in the figure = $7 + 8 + 4 + 2 + 3 + 4 = 28$.

4. Find the number of triangles in the given figure.



- A. 12
- B. 18
- C. 22
- D. 26

Answer: Option B



The simplest triangles are AHB, GHI, BJC, GFE, GIE, IJE, CEJ and CDE i.e. 8 in number.

The triangles composed of two components each are HEG, BEC, HBE, JGE and ICE i.e. 5 in number.

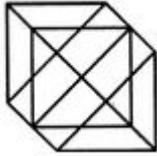
The triangles composed of three components each are FHE, GCE and BED i.e. 3 in number.

There is only one triangle i.e. AGC composed of four components.

There is only one triangle i.e. AFD composed of nine components.

Thus, there are $8 + 5 + 3 + 1 + 1 = 18$ triangles in the given figure.

5. Find the number of triangles in the given figure.



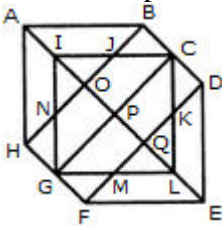
A. 18

B. 20

C. 24

D. 27

Answer: Option C



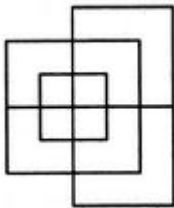
The simplest triangles are IJO, BCJ, CDK, KQL, MLQ, GFM, GHN and NIO i.e. 8 in number.

The triangles composed of two components each are ABO, AHO, NIJ, IGP, ICP, DEQ, FEQ, KLM, LCP and LGP i.e. 10 in number.

The triangles composed of four components each are HAB, DEF, LGI, GIC, ICL and GLC i.e. 6 in number.

Total number of triangles in the figure = $8 + 10 + 6 = 24$.

6. Find the minimum number of straight lines required to make the given figure.



A. 13

B. 15

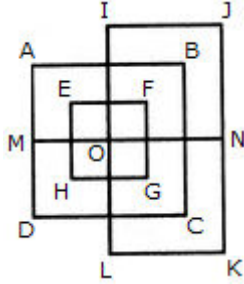
C. 17

D. 19

Answer: Option A

Explanation:

The figure may be labelled as shown.

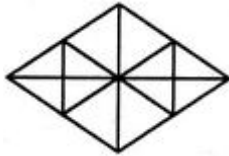


The horizontal lines are IJ, AB, EF, MN, HG, DC and LK i.e. 7 in number.

The vertical lines are AD, EH, IL, FG, BC and JK i.e. 6 in number.

Thus, there are $7 + 6 = 13$ straight lines in the figure.

7. Find the number of triangles in the given figure.



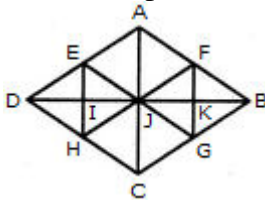
A. 16

B. 22

C. 28

D. 32

Answer: Option C



The simplest triangles are AFJ, FJK, FKB, BKG, JKG, JGC, HJC, HIJ, DIH, DEI, EIJ and AEJ i.e. 12 in number.

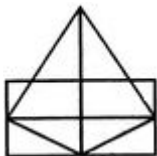
The triangles composed of two components each are JFB, FBG, BJG, JFG, DEJ, EJH, DJH and DEH i.e. 8 in number.

The triangles composed of three components each are AJB, JBC, DJC and ADJ i.e. 4 in number.

The triangles composed of six components each are DAB, ABC, BCD and ADC i.e. 4 in number.

Thus, there are $12 + 8 + 4 + 4 = 28$ triangles in the figure.

8. Find the number of triangles in the given figure.



A. 11

B. 13

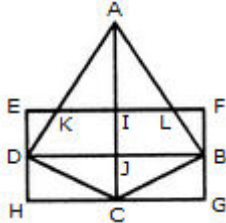
C. 15

D. 17

Answer: Option C

Explanation:

The figure may be labelled as shown.



The simplest triangles are AKI, AIL, EKD, LFB, DJC, BJC, DHC and BCG i.e. 8 in number.

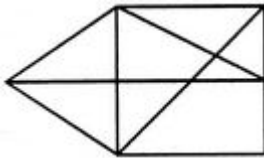
The triangles composed of two components each are AKL, ADJ, AJB and DBC i.e. 4 in number.

The triangles composed of the three components each are ADC and ABC i.e. 2 in number.

There is only one triangle i.e. ADB composed of four components.

Thus, there are $8 + 4 + 2 + 1 = 15$ triangles in the figure.

9. Find the number of triangles in the given figure.



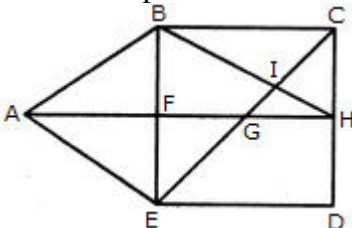
A. 12

B. 13

C. 14

D. 15

Answer: Option D



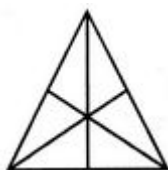
The simplest triangles are ABF, BIC, CIH, GIH, FGE and AFE i.e. 6 in number.

The triangles composed of two components each are ABE, AGE, BHF, BCH, CGH and BIE i.e. 6 in number.

The triangles composed of three components each are ABH, BCE and CDE i.e. 3 in number.

Hence, the total number of triangles in the figure = $6 + 6 + 3 = 15$.

10. Find the number of triangles in the given figure.



A. 16

B. 13

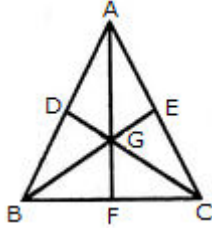
C. 9

D. 7

Answer: Option A

Explanation:

The figure may be labelled as shown.



The simplest triangles are AGE, EGC, GFC, BGF, DGB and ADG i.e. 6 in number.
The triangles composed of two components each are AGC, BGC and ABG i.e. 3 in number.

The triangles composed of three components each are AFC, BEC, BDC, ABF, ABE and DAC i.e. 6 in number.

There is only one triangle i.e. ABC composed of six components.

Thus, there are $6 + 3 + 6 + 1 = 16$ triangles in the given figure.

11. Find the number of triangles in the given figure.



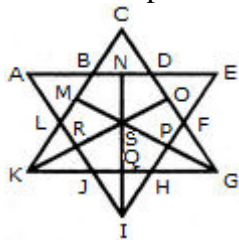
A. 21

B. 23

C. 25

D. 27

Answer: Option D



The simplest triangles are ABL, BCD, DEF, FGP, PGH, QHI, JQI, KRJ and LRK i.e. 9 in number.

The triangles composed of two components each are OSG, SGQ, SPI, SRI, KSQ, KMS, FGH, JHI and JKL i.e. 9 in number.

There is only one triangle i.e. KSG which is composed of four components.

The triangles composed of five components each are NEI, ANI, MCG and KCO i.e. 4 in number.

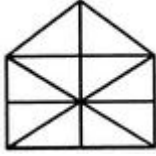
The triangles composed of six components each are GMK and KOG i.e. 2 in number.

There is only one triangle i.e. AEI composed of ten components.

There is only one triangle i.e. KCG composed of eleven components.

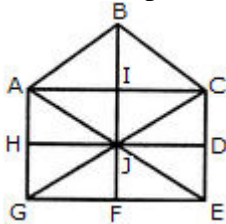
Therefore, Total number of triangles in the given figure = $9 + 9 + 1 + 4 + 2 + 1 + 1 = 27$.

12. Find the number of triangles in the given figure.



- A. 10
- B. 19
- C. 21
- D. 23

Answer: Option C



The simplest triangles are ABI, BIC, AIJ, CIJ, AHJ, CDJ, JHG, JDE, GJF and EJF i.e. 10 in number.

The triangles composed of two components each are ABC, BCJ, ACJ, BAJ, AJG, CJE and GJE i.e. 7 in number.

The triangles composed of four components each are ACG, ACE, CGE and AGE i.e. 4 in number.

Total number of triangles in the figure = $10 + 7 + 4 = 21$.

13. Find the number of triangles in the given figure.

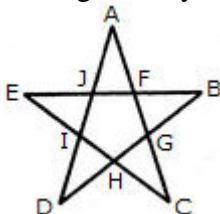


- A. 5
- B. 6
- C. 8
- D. 10

Answer: Option D

Explanation:

The figure may be labelled as shown.

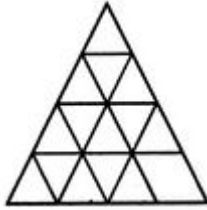


The simplest triangles are AJF, FBG, GCH, HDI and IEJ i.e. 5 in number.

The triangles composed of three components each EBH, AIC, EFC, ADG and BJD i.e. 5 in number.

Thus, there are $5 + 5 = 10$ triangles in the figure.

14. Find the minimum number of straight lines required to make the given figure.

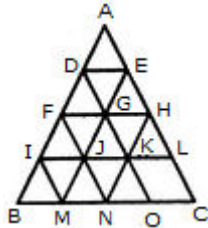


- A. 9
- B. 11
- C. 15
- D. 16

Answer: Option B

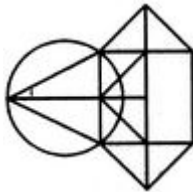
Explanation:

The figure may be labelled as shown.



The horizontal lines are DE, FH, IL and BC i.e. 4 in number.
 The slanting lines are AC, DO, FN, IM, AB, EM and HN i.e. 7 in number.
 Thus, there are $4 + 7 = 11$ straight lines in the figure.

15. Find the number of triangles in the given figure.

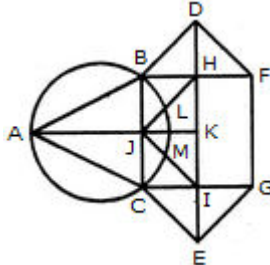


- A. 10
- B. 12
- C. 14
- D. 16

Answer: Option C

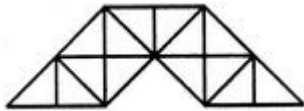
Explanation:

The figure may be labelled as shown.



The simplest triangles are ABJ, ACJ, BDH, DHF, CIE and GIE i.e. 6 in number.
 The triangles composed of two components each are ABC, BDF, CEG, BHJ, JHK, JKI and CJI i.e. 7 in number.
 There is only one triangle JHI which is composed of four components.
 Thus, there are $6 + 7 + 1 = 14$ triangles in the given figure.

16. Find the number of triangles in the given figure.



A. 23

B. 27

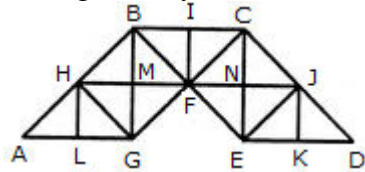
C. 29

D. 31

Answer: Option C

Explanation:

The figure may be labelled as shown.



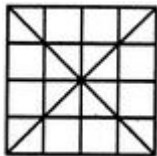
The simplest triangles are AHL, LHG, GHM, HMB, GMF, BMF, BIF, CIF, FNC, CNJ, FNE, NEJ, EKJ and JKD i.e. 14 in number.

The triangles composed of two components each are AGH, BHG, HBF, BFG, HFG, BCF, CJF, CJE, JEF, CFE and JED i.e. 11 in number.

The triangles composed of four components each are ABG, CBG, BCE and CED i.e. 4 in number.

Total number of triangles in the given figure = 14 + 11 + 4 = 29.

17. Find the number of triangles in the given figure.



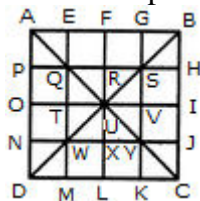
A. 36

B. 40

C. 44

D. 48

Answer: Option D



The simplest triangles are APQ, AEQ, QTU, QRU, BGS, BHS, RSU, SUV, TUW, UWX, NWD, WDM, UUY, UXY, JCY and YKC i.e. 16 in number.

The triangles composed of two components each are QUW, QSU, SYU and UWY i.e. 4 in number.

The triangles composed of three components each are AOU, AFU, FBU, BIU, UIC, ULC, ULD and OUD i.e. 8 in number.

The triangles composed of four components each are QYW, QSW, QSY and SYW i.e. 4 in number.

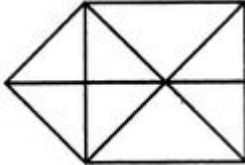
The triangles composed of six components each are AUD, ABU, BUC and DUC i.e. 4 in number.

The triangles composed of seven components each are QMC, ANY, EBW, PSD, CQH, AGY, DSK and BJW i.e. 8 in number.

The triangles composed of twelve components each are ABD, ABC, BCD and ACD i.e. 4 in number.

Thus, there are $16 + 4 + 8 + 4 + 4 + 8 + 4 = 48$ triangles in the figure.

18. Find the number of triangles in the given figure.



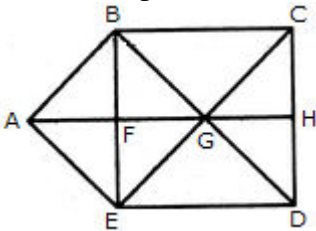
A. 15

B. 16

C. 17

D. 18

Answer: Option C



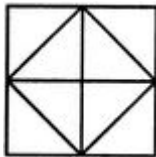
The simplest triangles are ABF, BFG, BCG, CGH, GHD, GED, EFG and AFE i.e. 8 in number.

The triangles composed of two components each are ABG, BGE, AGE, ABE and GCD i.e. 5 in number.

The triangles composed of three components each are BCD, CDE, BED and BCE i.e. 4 in number.

Thus, there are $8 + 5 + 4 = 17$ triangles in the figure.

19. Find the number of triangles in the given figure.



A. 8

B. 10

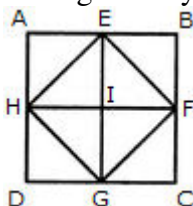
C. 12

D. 14

Answer: Option C

Explanation:

The figure may be labelled as shown.



The simplest triangles are AEH, EHI, EBF, EFI, FGC, IFG, DGH and HIG i.e. 8 in number.

The triangles composed of two components each are HEF, EFG, HFG and EFG i.e. 4 in number.

Thus, there are $8 + 4 = 12$ triangles in the figure.

20. Find the number of triangles in the given figure.



A. 8

B. 10

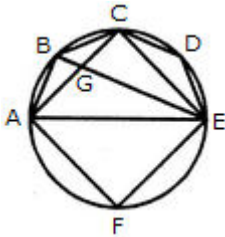
C. 11

D. 12

Answer: Option B

Explanation:

The figure may be labelled as shown.

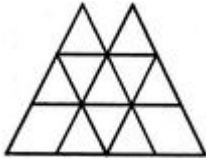


The simplest triangles are ABG, BCG, CGE, CDE, AGE and AEF i.e. 6 in number.

The triangles composed of two components each are ABE, ABC, BCE and ACE i.e. 4 in number.

There are $6 + 4 = 10$ triangles in the figure.

21. Find the number of triangles in the given figure.



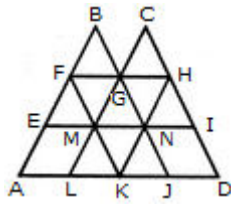
A. 16

B. 18

C. 14

D. 15

Answer: Option B



The simplest triangles are BFG, CGH, EFM, FMG, GMN, GHN, HNI, LMK, MNK and KNJ i.e. 10 in number.

The triangles composed of three components each are FAK and HKD i.e. 2 in number.

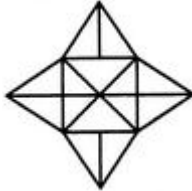
The triangles composed of four components each are BEN, CMI, GLJ and FHK i.e. 4 in number.

The triangles composed of eight components each are BAJ and OLD i.e. 2 in number.

Thus, there are $10 + 2 + 4 + 2 = 18$ triangles in the given figure.

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22. Find the number of triangles in the given figure.



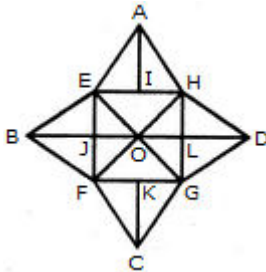
A. 18

B. 20

C. 28

D. 34

Answer: Option C



The simplest triangles are AEI, AIH, BEJ, BJE, CFK, CKG, DGL, DLH, EOJ, FOJ, FOG, LOG, HOL and HOE i.e. 14 in number.

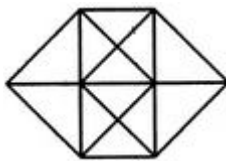
The triangles composed of two components each are EAH, FBE, BEO, EOF, BFO, FCG, GDH, HOD, HOG and GOD i.e. 10 in number.

The triangles composed of three components each are EFH, EHG, FGH and EFG i.e. 4 in number.

Thus, there are $14 + 10 + 4 = 28$ triangles in the given figure.

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23. Find the number of triangles in the given figure.



A. 20

B. 24

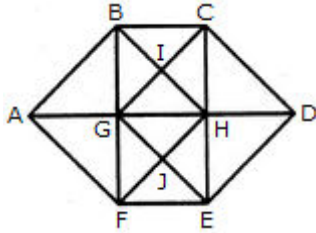
C. 28

D. 32

Answer: Option C

Explanation:

The figure may be labelled as shown.



The simplest triangles are ABG, BIG, BIC, CIH, GIH, CDH, HED, GHJ, HJE, FEJ, GFJ and AGF i.e. 12 in number.

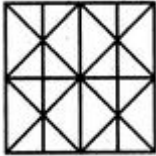
The triangles composed of two components each are ABF, CDE, GBC, BCH, GHG, BHG, GHF, GHE, HEF and GEF i.e. 10 in number.

The triangles composed of three components each are ABH, AFH, CDG and GDE i.e. 4 in number.

The triangles composed of four components each are BHF and CGE i.e. 2 in number.

Total number of triangles in the figure = $12 + 10 + 4 + 2 = 28$.

24. Find the minimum number of straight lines required to make the given figure.



A. 11

B. 14

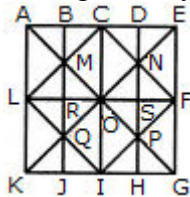
C. 16

D. 17

Answer: Option B

Explanation:

The figure may be labelled as shown.



The horizontal lines are AK, BJ, CI, DH and EG i.e. 5 in number.

The vertical lines are AE, LF and KG i.e. 3 in number.

The slanting lines are LC, CF, FI, LI, EK and AG i.e. 6 in number.

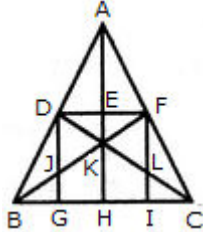
Thus, there are $5 + 3 + 6 = 14$ straight lines in the figure.

25. What is the number of straight lines and the number of triangles in the given figure.



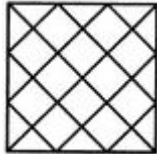
- A. 10 straight lines and 34 triangles
- B. 9 straight lines and 34 triangles
- C. 9 straight lines and 36 triangles
- D. 10 straight lines and 36 triangles

Answer: Option C



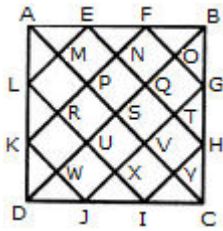
The Horizontal lines are DF and BC i.e. 2 in number.
 The Vertical lines are DG, AH and FI i.e. 3 in number.
 The Slanting lines are AB, AC, BF and DC i.e. 4 in number.
 Thus, there are $2 + 3 + 4 = 9$ straight lines in the figure.
 Now, we shall count the number of triangles in the figure.
 The simplest triangles are ADE, AEF, DEK, EFK, DJK, FLK, DJB, FLC, BJB and LIC i.e. 10 in number.
 The triangles composed of two components each are ADF, AFK, DFK, ADK, DKB, FCK, BKH, KHC, DGB and FIC i.e. 10 in number.
 The triangles composed of three components each are DFJ and DFL i.e. 2 in number.
 The triangles composed of four components each are ABK, ACK, BFI, CDG, DFB, DFC and BKC i.e. 7 in number.
 The triangles composed of six components each are ABH, ACH, ABF, ACD, BFC and CDB i.e. 6 in number.
 There is only one triangle i.e. ABC composed of twelve components.
 There are $10 + 10 + 2 + 7 + 6 + 1 = 36$ triangles in the figure.

26. Find the number of triangles in the given figure.



- A. 28
- B. 32
- C. 36
- D. 40

Answer: Option C



The simplest triangles are AML, LRK, KWD, DWJ, JXI, IYC, CYH, HTG, GOB, BOF, FNE and EMA i.e. 12 in number.

The triangles composed of two components each are AEL, KDJ, HIC and FBG i.e. 4 in number.

The triangles composed of three components each are APF, EQB, BQH, GVC, CVJ, IUD, DUL and KPA i.e. 8 in number.

The triangles composed of six components each are ASB, BSG, CSD, DSA, AKF, EBH, GGJ and IDL i.e. 8 in number.

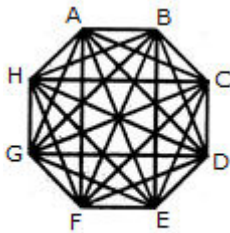
The triangles composed of twelve components each are ADB, ABC, BCD and CDA i.e. 4 in number.

Total number of triangles in the figure = $12 + 4 + 8 + 8 + 4 = 36$.

27. What is the number of triangles that can be formed whose vertices are the vertices of an octagon but have only one side common with that of octagon?

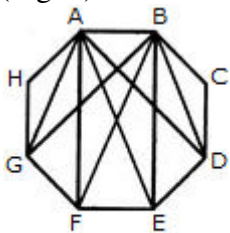
- A. 64
- B. 32
- C. 24
- D. 16

Answer: Option B



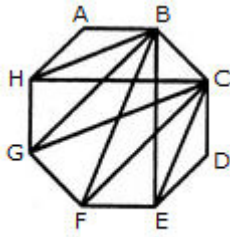
(Fig.1)

When the triangles are drawn in an octagon with vertices same as those of the octagon and having one side common to that of the octagon, the figure will appear as shown in (Fig. 1).



(Fig. 2)

Now, we shall first consider the triangles having only one side AB common with octagon ABCDEFGH and having vertices common with the octagon (See Fig. 2). Such triangles are ABD, ABE, ABF and ABG i.e. 4 in number.



(Fig.3)

Similarly, the triangles having only one side BC common with the octagon and also having vertices common with the octagon are BCE, BCF, BCG and BCH (as shown in Fig. 3). i.e. There are 4 such triangles.

This way, we have 4 triangles for each side of the octagon. Thus, there are $8 \times 4 = 32$ such triangles.

28. Find the number of triangles in the given figure.



A. 27

B. 25

C. 23

D. 21

Answer: Option A

The figure may be labelled as shown.



The simplest triangles are GLK, DLJ, DJM, HMN, QRE, IRA, IPA and FPO i.e. 8 in number.

The triangles having two components each are BDO, CDQ, DLM, PRA, KFI, NEI, HJI, GJI, DKI and DNI i.e. 10 in number.

The triangles having four components each are DIE, DFI, DOA, DQA and GHI i.e. 5 in number.

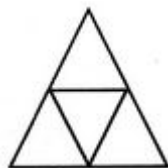
The triangles having six components each are DCA and DBA i.e. 2 in number.

DEF is the only triangle having eight components.

ABC is the only triangle having twelve components.

Thus, there are $8+10+ 5 + 2+1 + 1 = 27$ triangles in the figure.

29. Find the number of triangles in the given figure.



A. 4

B. 5

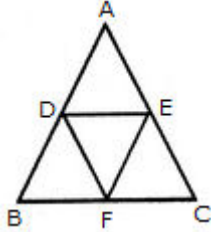
C. 6

D. 7

Answer: Option B

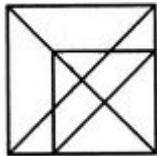
Explanation:

The figure may be labelled as shown.



The simplest triangles are ADE, BDF, DEF and EFC i.e. 4 in number.
 There is only one triangle ABC composed of four components.
 Thus, there are $4+1 = 5$ triangles in the given figure.

30. Find the number of triangles in the given figure.



A. 16

B. 18

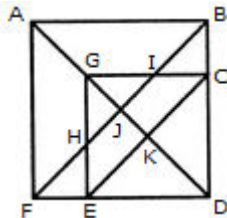
C. 19

D. 21

Answer: Option D

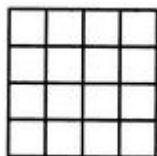
Explanation:

The figure may be labelled as shown.



The simplest triangles are EFH, BIC, GHJ, GIJ, EKD and CKD i.e. 6 in number.
 The triangles composed of two components each are ABJ, AFJ, GCK, GEK, CED and GHI i.e. 6 in number.
 The triangles composed of three components each are GCD, GED, DJB and DJF i.e. 4 in number.
 The triangles composed of four components each are ABF and GCE i.e. 2 in number.
 The triangles composed of five components each are ABD and AFD i.e. 2 in number.
 There is only one triangle i.e. FBD composed of six components.
 Total number of triangles in the figure = $6 + 6 + 4 + 2 + 2 + 1 = 21$.

1. Count the number of squares in the given figure.



A. 32

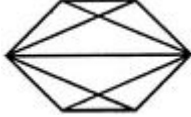
B. 30

C. 29

D. 28

Answer: Option B

2. Find the number of quadrilaterals in the given figure.



A. 6

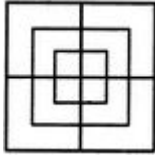
B. 7

C. 9

D. 11

Answer: Option D

3. Count the number of squares in the given figure.



A. 8

B. 12

C. 15

D. 18

Answer: Option C

4. What is the minimum number of colours required to fill the spaces in the given diagram without any two adjacent spaces having the same colour?



A. 6

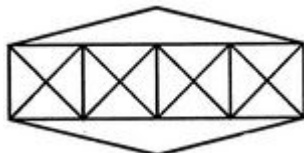
B. 5

C. 4

D. 3

Answer: Option D

5. Count the number of triangles and squares in the given figure.



A. 36 triangles, 7 squares

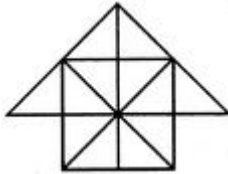
B. 38 triangles, 9 squares

C. 40 triangles, 7 squares

D. 42 triangles, 9 squares

Answer: Option C

6. Count the number of triangles and squares in the given figure.



A. 26 triangles, 5 squares

B. 28 triangles, 5 squares

C. 26 triangles, 6 squares

D. 28 triangles, 6 squares

Answer: Option D

7. What is the minimum number of different colours required to paint the given figure such that no two adjacent regions have the same colour?



A. 3

B. 4

C. 5

D. 6

Answer: Option A

8. Count the number of triangles and squares in the given figure.



A. 28 triangles, 3 squares

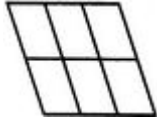
B. 24 triangles, 5 squares

C. 28 triangles, 5 squares

D. 24 triangles, 3 squares

Answer: Option C

9. Count the number of parallelogram in the given figure.



- A. 20
- B. 18
- C. 16
- D. 12

Answer: Option B

10. In the adjoining figure, if the centres of all the circles are joined by horizontal and vertical lines, then find the number of squares that can be formed.

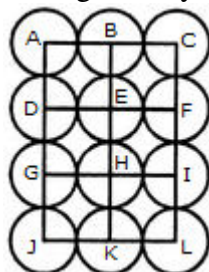


- A. 6
- B. 7
- C. 8
- D. 1

Answer: Option C

Explanation:

The figure may be labelled as shown.



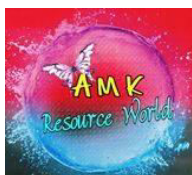
We shall join the centres of all the circles by horizontal and vertical lines and then label the resulting figure as shown.

The simplest squares are ABED, BCFE, DEHG, EFIH, GHKJ and HILK i.e. 6 in number.

The squares composed of four simple squares are ACIG and DFLJ i.e. 2 in number.

Thus, $6 + 2 = 8$ squares will be formed.

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