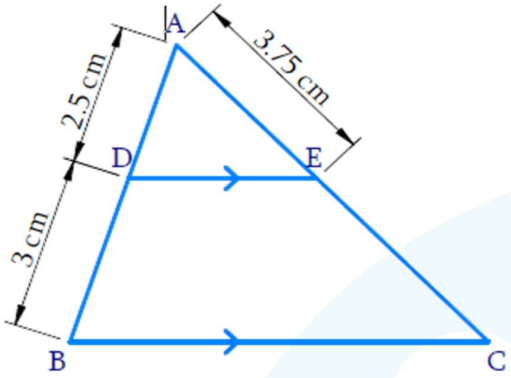
Similar Triangles

Review Exercise Questions

Level-1

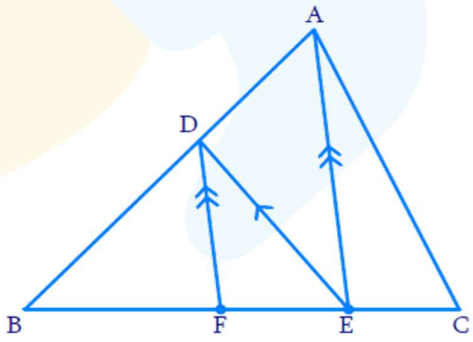
Q1. In the following figure, $DE \parallel BC$:



The length of AC is

(A) 7.25cm
(B) 7.5cm
(C) 7.75cm
(D) 8.25cm

Q2. In the following figure, E is an arbitrary point on side BC of ΔABC. ED is parallel to CA, and DF is parallel to AE. Which of the following is correct?



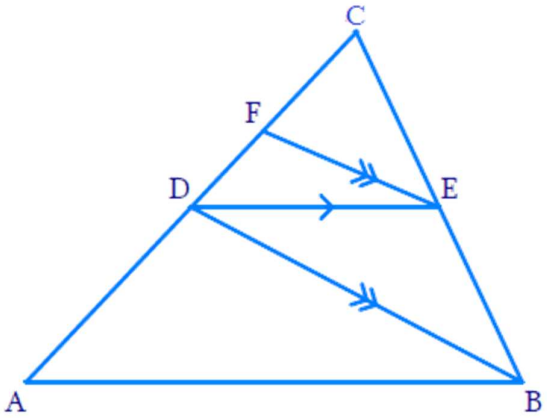
(A) $\frac{BF}{FE} = \frac{FD}{EA}$

(B) $\frac{BF}{FE} = \frac{AC}{DE}$

(C) $\frac{BE}{EC} = \frac{BF}{FE}$

(D) None of these

Q3. In the following figure, DE is parallel to AB, and EF is parallel to BD.



Which of the following is correct?

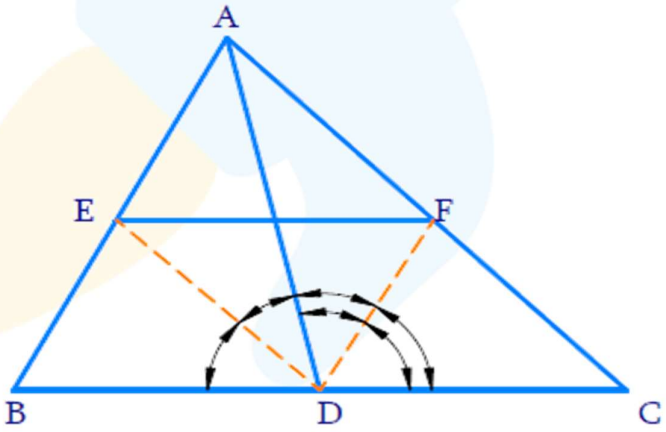
(A) $2CD = CF + AC$

(B) $AC^2 - CF^2 = CD^2$

(C) $\frac{2}{CD} = \frac{1}{CF} + \frac{1}{AC}$

(D) $CD^2 = CD \times AC$

Q4. In the following figure, AD is the median through A, while DE and DF are the angle bisectors of $\angle ADB \ \ and \ \ \angle ADC$ respectively:



Which of the following is correct?

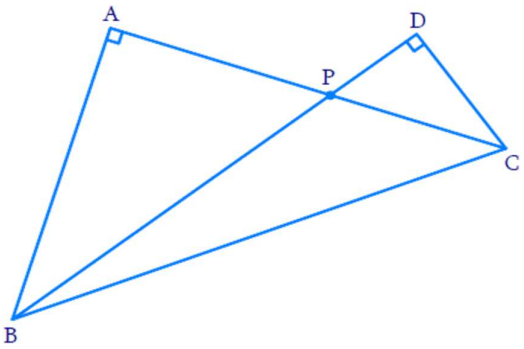
(A) $EF \parallel BC$ in all the case

(B) $EF \parallel BC$ only if ΔABC is isosceles

(C) $EF \parallel BC$ only if ΔABC is acute angled

(D) None of these

Q5. Consider the following figure:



Which of the following is correct?

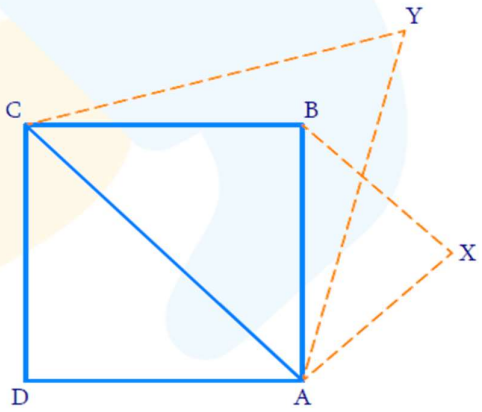
(A) $\frac{AP}{PC}=\frac{BP}{PD}$

(B) $AP\times PC=BP\times PD$

(C) $\frac{AP}{AC}=\frac{BP}{BD}$

(D) None of these

Q6. In a square ABCD, equilateral triangles are drawn using AB and AC as sides:



The ratio of their areas is

(A) $1:\sqrt{2}$

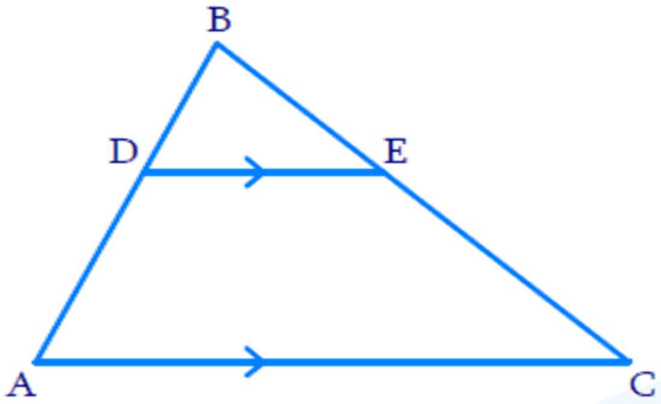
(B) $1:2$

(C) $1:2\sqrt{2}$

(D) $1:4$

(E) None of these

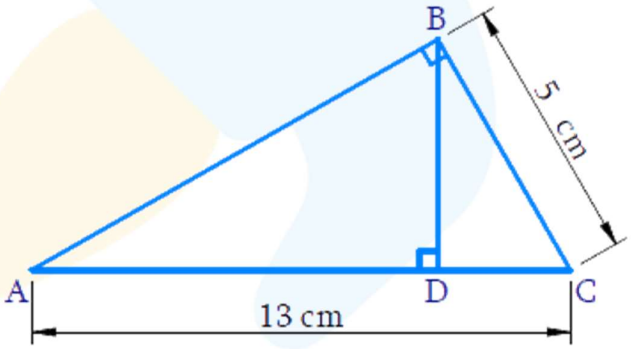
Q7. In the following figure, $AB:DB=3:2$, and $DE\,||AC$.



The ratio of areas of trapezium ABEC and ΔABC is

(A) 13:25
(B) 17:25
(C)19:25
(D)21:25

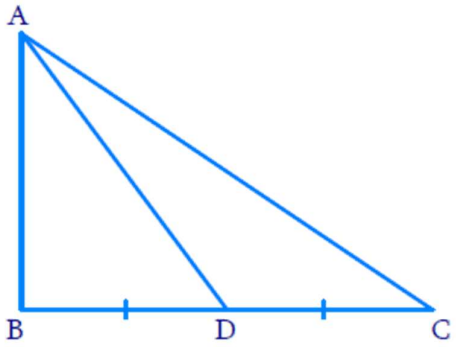
Q8. Consider the following figure:



The ratio of the areas of ΔABD and ΔABC is

(A)12:13
(B)5:13
(C)144:169
(D)25:169
(E)*None of these*

Q9. Consider the following figure. D is the mid- point of BC:



Which of the following relations is correct?

(A) $AC^2 = 3AD^2 - AB^2$

(B) $AC^2 = 4AD^2 - 3AB^2$

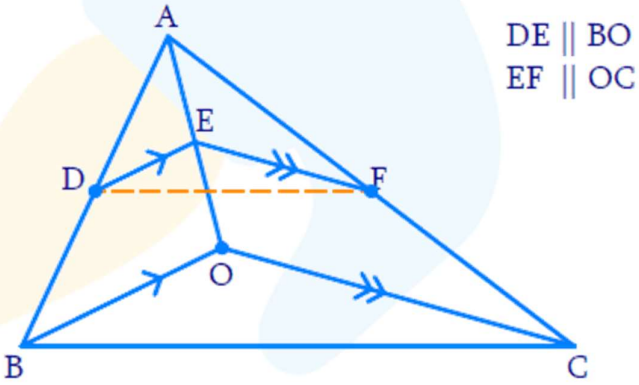
(C) $AC^2 = 2AD^2 + AB^2$

(D) $AC^2 = AD^2 + 2AB^2$

(E) *None of these*

Multiple options may be correct

Q10. Consider the following figure. O is an arbitrary point inside ΔABC:



Which of the following are correct?

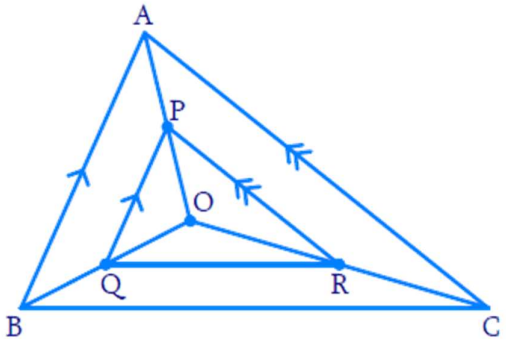
(A) $\frac{AD}{DB} = \frac{AE}{EO}$

(B) $\frac{AF}{AC} = \frac{EF}{OC}$

(C) $\frac{AD}{AB} = \frac{AF}{AC}$

(D) $DF \| BC$

Q11. O is an arbitrary point inside ΔABC . P is an arbitrary point on AO. PQ and PR are parallel to AB and AC respectively:

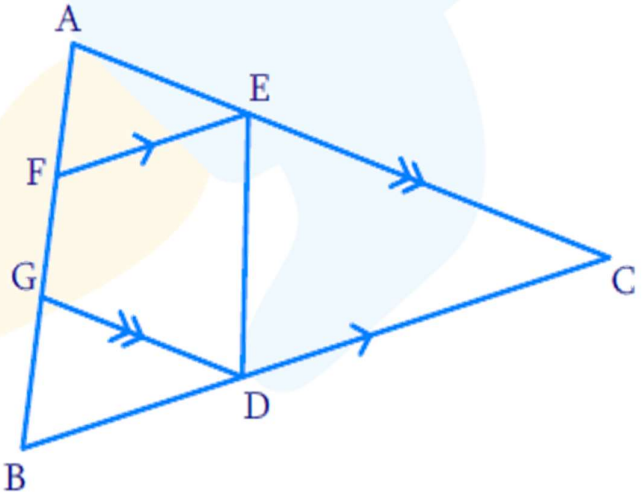


Which of the following is correct?

(A) $\frac{OP}{PA}=\frac{OQ}{QB}$ (B) $\frac{OP}{OA}=\frac{PR}{AC}$

(C) $\frac{OQ}{QB}=\frac{OR}{RC}$ (D) $QR \| BC$

Q12. In the following figure, AF=BG, $FE \| BC$ and $GD \| AC$:

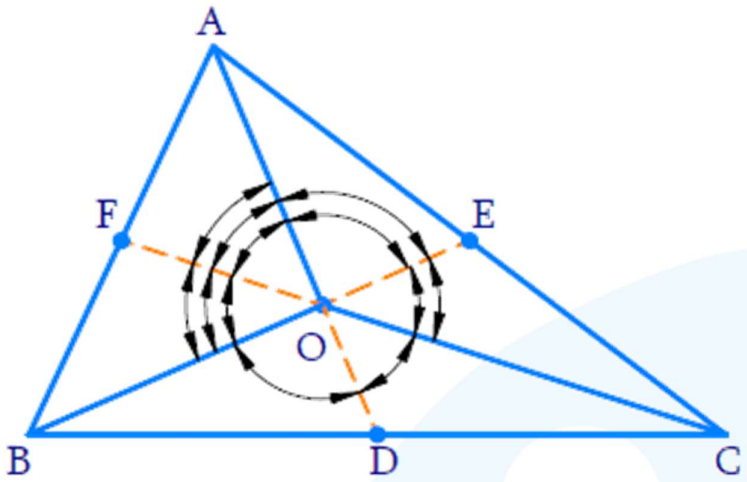


Which of the following are correct?

(A) $\frac{AF}{AB}=\frac{AE}{EC}$ (B) $\frac{BG}{GA}=\frac{BD}{DC}$

(C) $\frac{AE}{EC}=\frac{BD}{DC}$ (D) $ED \| AB$

Q13. O is any point inside ΔABC. OD, OE and OF are the bisectors of $\angle BOC, \angle COA \text{ and } \angle AOB$ respectively:



Which of the following are correct?

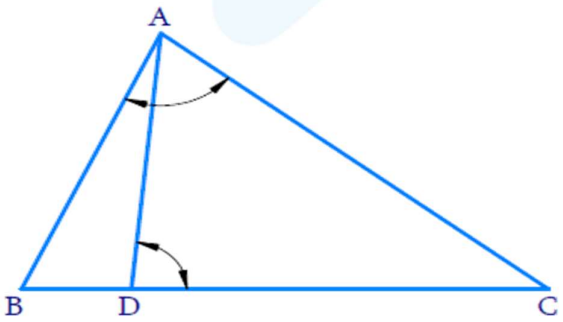
(A) $OA.CB = AF.FB$

(B) $OB.CD = OC.BD$

(C) $OC.CE = OA.AE$

(D) $AF.BD.CE = BF.CD.AE$

Q14. D is a point on BC in ΔABC such that $\angle ADC = \angle BAC$:



Which of the following are correct?

(A) $\Delta BAD \sim \Delta BCA$

(B) $\Delta BAC \sim \Delta ACD$

(C) $\frac{AB}{BC} = \frac{AD}{AC}$

(D) $AC^2 = BC \times CD$

Q15. Which of the following are Pythagorean triplets for any positive value of x?

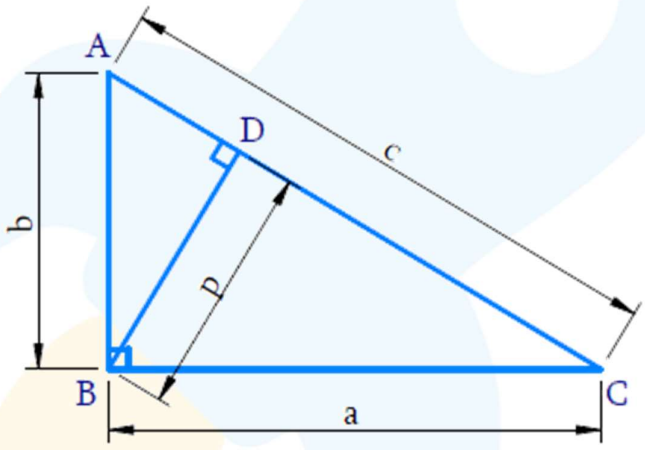
(A) $6x, 8x, 10x$

(B) $8(x-1), 17x-17, 15(x-1)$

(C) $2x-1, 2x+1, 2\sqrt{2x}$

(D) $x, x+2, x+5$

Q16. Consider the following figure:



Which of the following are correct?

(A) $c^2 - p^2 = |a^2 - b^2|$

(B) $cp = ab$

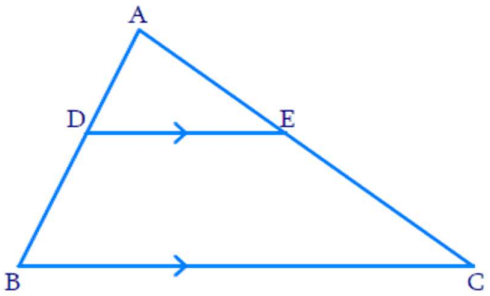
(C) $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

(D) $\frac{1}{b} + \frac{1}{c} = \frac{1}{a} + \frac{1}{b}$

(E) $p^2 = AD \times CD$

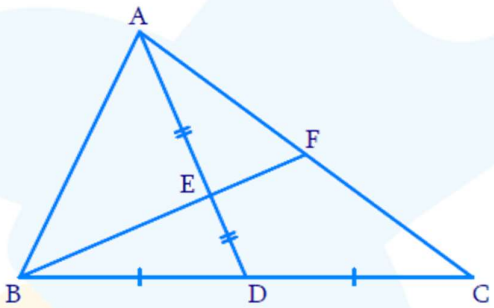
Integers answer

Q17. Consider the following figure, in which $DE \| BC$, AC:DB=3:5 and AC=4.8cm:



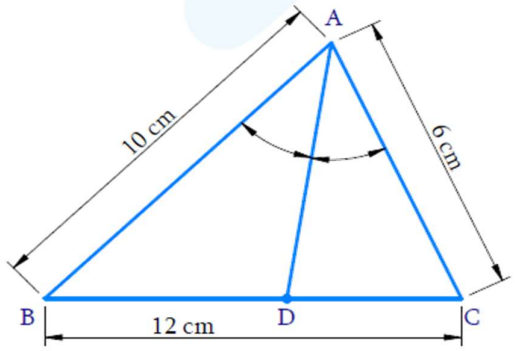
The value of 5AE is_____cm

Q18. In ΔABC, AD is the median through A, and E is the mid-point of AD. BE intersects AC at F:



If AC=kAF, the value of k is _____.

Q19. Consider the following figure, in which AD is the bisector of $\angle A$:



The value of 2BD is _____cm.

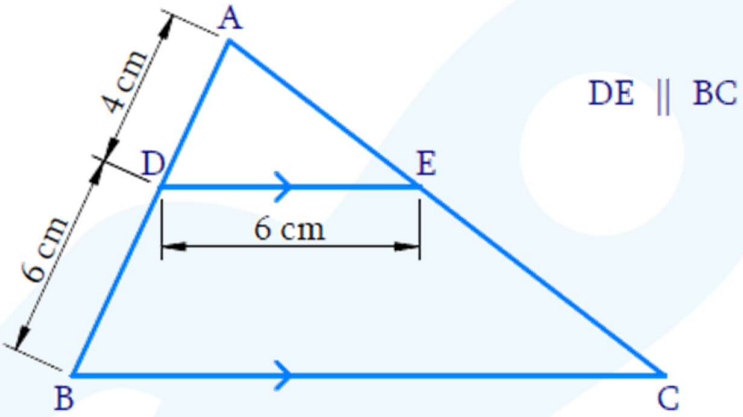
Q20. The perimeters of ΔABC and ΔXYZ are 20cm and 15cm respectively. The following additional information is known

$\angle A = \angle Y$
$\angle C = \angle X$
$AC = 8cm$

The length of XY is _____ cm.

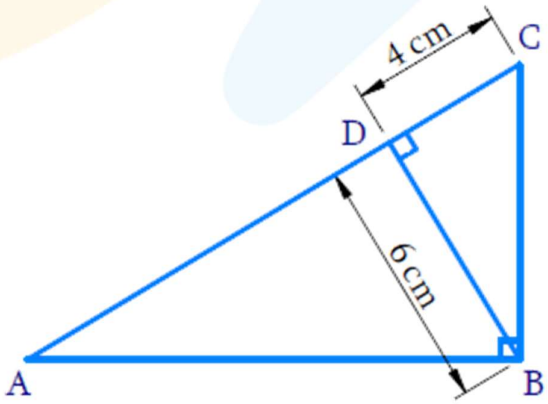
Q21. ABCD is a parallelogram. P is the mid-point of AB. Q is a point on BD such that BQ: QD =1:3. PQ meets BC at R. The value of $BR \mid RC$ is _____.

Q22. Consider the following figure:



The length of BC is _____ cm.

Q23. Consider the following figure:

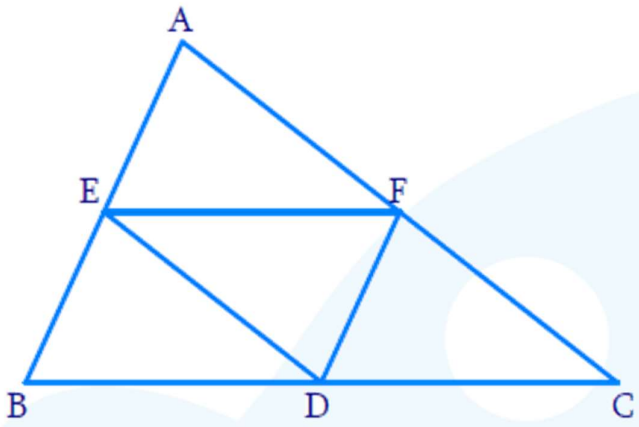


The length of AD is_____ cm

Q24. The areas of two similar triangles are $100cm^2$ and $64cm^2$. If an altitude of the first triangle is 10cm long. how long is the corresponding altitude of the second triangle?

Q25. ABCD is a trapezium with $AB||CD \text{ and } AB = 2CD.$ if the area of $\Delta AOB \text{ is } 100cm^2$, what is the area of ΔCOD? _____ cm^2

Q26. In ΔABC ,D ,E and F are the mid-points of BC, CA and AB respectively.



The value of $\frac{area(\Delta ABC)}{area(\Delta DEF)}$ is _____.

Q27. ΔABC is right-angled at A. P and Q are points on AB such that AP=PQ=QB. If $3CB^2 + 5CP^2 = \lambda CQ^2$, the value of λ is_____.

Miscellaneous

Q28. (a) Consider a trapezium ABCD with AB || CD. The diagonals of this trapezium meet at O. Show that AO: OC = BO : OD.
(b) Prove the converse also. That is, if AO : OC = BO : OD, show that ABCD is a trapezium.

Q29. In an isosceles ΔABC, with vertex A the bisectors of $\angle B \text{ and } \angle C$ meet the opposite sides at E and F respectively. Prove that FE || BC.

Q30. In ΔABC, the angle bisector BE and CF of $\angle B$ and $\angle C$ respectively meet at I. Prove that AF : FI = AC : CI.

Q31. ΔABC is similar to ΔDEF with X and Y as the mid-points of the corresponding sides BC and EF. Prove that AX: DY = BC : EF.

Q32. In a quadrilateral ABCD, $AC \perp BD$. Show that $AB^2 + CD^2 = BC^2 + DA^2$.

Q33. In a parallelogram ABCD, the side CD is bisected at P and BP meets AC at X. Find AX: AC.

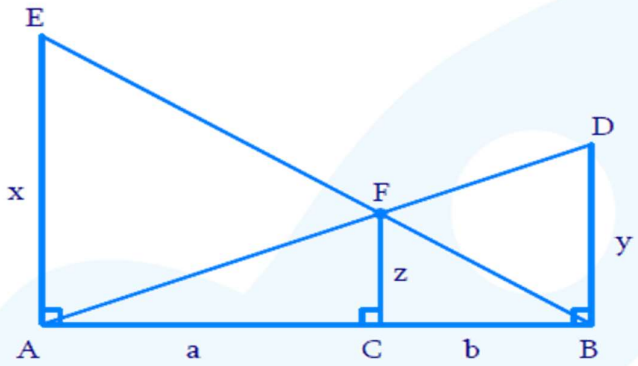
Q34. Suppose that $\Delta ABC \sim \Delta DEF$ and AX and DY are altitudes in the two triangles (respectively). Show that AX: DY = BC: EF.

Q35. In a quadrilateral ABCD, AB = AD. The bisectors of $\angle BAC$ and $\angle DAC$ meet BC and CD at E and F respectively. Show that EF is parallel to BD.

Q36. In a quadrilateral ABCD, AD = BC. Show that the mid-points of AB, CD, AC and BD form the vertices of a rhombus.

Q37. Triangle ABC is equilateral. D is a point on BC such that BD is one-third of BC. Show that $9AD^2 = 7AB^2$.

Q38. Consider the following figure:



Show that $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$.