

by 13.

$30 \times 0 \times 03$????????? ????? ?????? ????? ?????? ??? ????? ????????? 13 ?? ????????? ???

(b) The four digit number $8mn9$ is a perfect square. What is the value of m^2+n^2 ?

????? ??? ?????? $8mn9$??? ?????????? ?'?? m^2+n^2 ? ??? ?????? ????

4. (a) A man walk 4Km east, 2Km north, 8Km south and then 5Km east. What is the shortest distance he would have to walk in order to get back to his starting point?

?? ?????? ??? ??? 4 ??., ????? ??? 2 ??., ????? ??? 8 ??., ??? ??? ??? ??? 5 ??.,
?? ????????? ??????? ?? ????? ??? ??? ?????? ??? ?????? ??? ?????? ??? ??? ??????

(b) Two trains 3Km apart and of length 200 meter and 300 meter are travelling towards each other with speed 30meter/sec and 20meter/sec respectively. Find the time taken by the trains to cross each other completely.

200 ????? ??? 300 ????? ?????????? ??? ??????? 3 ??., ????? ??? ????? 30 ??/?????? ??? 20
??/?????? ??? ?????? ??? ?????? ?????? ?????? ?????? ?????? ?????? ?????? ??? ??????
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5. (a) A and B can do a work in 18 days and 24 days respectively. They worked together for 8 days and then A left. Find the number of days required to complete the remaining work by B alone.

A ??? B? ??? ??? ????? 18 ??? ??? 24 ?????? ?????? ?????? ?????? 8 ??? ??? ?????? ??? A? ???
?????? ??? ??? ????? B? ????? ?????? ?????? ??? ?????? ?' ?????? ????

(b) If a and b are two odd integers, prove that a^2-b^2 is divisible by 8.

??? a ??? b ????? ?????? ??????, ?????? ??? ? a^2-b^2 ????????? 8?? ?????? ?'??

6. (a) If $x = \sqrt{2 + \sqrt{2 + \sqrt{2 + \dots}}}$, find x. (x?? ??? ?????? ????)

(b) 56 teams participated in a football tournament to be played in a knockout format. Find the total number of matches to be played to select the champion team.

56 ?? ????? ??? ??? ?????????????? ????????? ?????? ??? ?????? ?????? ?????? ???, ?????? ??
????????? ??? ?????? ?????? ??? ?????? ?????? ?????? ??????

10. (a) If a, b, c are real numbers such that $a+b+c=4$ and $a^2+b^2+c^2=6$. Show that $2 \leq 3bc \leq 6$.

a, b, c satisfy $a+b+c=4$ and $a^2+b^2+c^2=6$. Show that $2 \leq 3bc \leq 6$?

(b) Which of the following fraction is greater? Justify using algebra.

???, ?????? ?????? ???, ?????? ?????? ??? ?????? ???

$\frac{10^{99}+1}{10^{98}+1}$ and $\frac{10^{100}+1}{10^{99}+1}$