

Calculators Allowed

Problems 7-8. Time limit: 10 minutes.

7. Four men in a room are each accused of a crime.
- If the statement “All of the men are guilty” is false
 - and the statement “All of the men are innocent” is false,
 - and the statement “An odd number of men are guilty” is false,
- how many of the men are guilty?

8. In triangle ABD, point C is on the segment between A and D so that $\angle ABC \cong \angle CBD$. Given lengths $AB = 6$, $BD = 9$, and $AD = 10$, find length AC
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Problems 9-10. Time limit: 10 minutes.

9. A polynomial has degree 4 and the y-intercept of its graph is -48 . The coefficient of its 4th degree term is -2 . It has four x-intercepts, three of which are 4, -3 , and $\frac{1}{2}$. Find the fourth x-intercept.

10. a, b, and c are real numbers. The average of a and b is c. The average of a and c is one more than b. The average of b and c is two more than twice a. Find the value of c.
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Problems 11-12. Time limit: 10 minutes.

11. Several married couples attend a party. Everyone shakes hands once with each person at the party except themselves and their spouse. If 40 handshakes took place, how many couples were at the party?
12. A positive integer leaves
- a remainder of 7 when divided by 8,
 - a remainder of 5 when divided by 6,
 - a remainder of 3 when divided by 4,
 - and a remainder of 1 when divided by 2. Find the least such positive integer.
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Answers.

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| 7. | 2 | 8. | 4 |
| 9. | -4 | 10. | $\frac{-11}{3}$ |
| 11. | 5 | 12. | 23 |