

dMAT Core Module

Mathematical Equations Practice Set

10 practice questions with systems of equations and a full answer key

Format: 10 questions | Recommended time: 12 minutes | Every letter is a whole number between 1 and 20, and every system has exactly one valid solution. No calculator or rough paper allowed on the real exam.

- Solve each system of equations using substitution and back-substitution, entirely mentally.
- Every unknown is a whole number from 1 to 20, and each system has exactly one solution.
- Answers and full working are on the last page.

Question 1

$$A + B = 12$$

$$B = A + 2$$

$$C = A + B$$

Find A , B , and C .

Question 2

$$A + 6 = 13$$

$$B - 4 = A$$

Find A and B .

Question 3

$$2A = B$$

$$A + B = 15$$

Find A and B .

Question 4

$$A - B = 3$$

$$A + B = 11$$

Find A and B .

Question 5

$$B = 2A - 1$$

$$A + B = 14$$

Find A and B .

Question 6

$$A + B + C = 20$$

$$A = B$$

$$C = B + 2$$

Find A , B , and C .

Question 7

$$A = 2B$$

$$B = 2C$$

$$A + B + C = 14$$

Find A , B , and C .

Question 8

$$A + B = 16$$

$$A - B = 4$$

Find A and B .

Question 9

$$3A = B + 5$$

$$A + B = 15$$

Find A and B .

Question 10

$$A + B + C = 24$$

$$B = 2A$$

$$C = 3A$$

Find A , B , and C .

Answer Key & Full Working

Question 1 Answer: $A = 5$, $B = 7$, $C = 12$

Substitute $B = A + 2$ into the first equation: $A + (A + 2) = 12$, so $2A = 10$, $A = 5$. Then $B = 7$, and $C = A + B = 12$.

Question 2 Answer: $A = 7$, $B = 11$

The first equation has only A : $A = 13 - 6 = 7$. Substitute into the second: $B - 4 = 7$, so $B = 11$.

Question 3 Answer: $A = 5$, $B = 10$

Substitute $B = 2A$ into the second equation: $A + 2A = 15$, so $3A = 15$, $A = 5$. Then $B = 10$.

Question 4 Answer: $A = 7$, $B = 4$

Add both equations: $2A = 14$, so $A = 7$. Substitute back: $7 - B = 3$, so $B = 4$.

Question 5 Answer: $A = 5$, $B = 9$

Substitute $B = 2A - 1$ into the second equation: $A + (2A - 1) = 14$, so $3A = 15$, $A = 5$. Then $B = 9$.

Question 6 Answer: $A = 6$, $B = 6$, $C = 8$

Since $A = B$, replace A with B : $B + B + (B+2) = 20$, so $3B = 18$, $B = 6$. Then $A = 6$, and $C = B + 2 = 8$.

Question 7 Answer: $A = 8$, $B = 4$, $C = 2$

Express everything in terms of C : $B = 2C$, $A = 2B = 4C$. Substitute: $4C + 2C + C = 14$, so $7C = 14$, $C = 2$. Then $B = 4$, $A = 8$.

Question 8 Answer: $A = 10$, $B = 6$

Add both equations: $2A = 20$, so $A = 10$. Substitute back: $10 + B = 16$, so $B = 6$.

Question 9 Answer: $A = 5$, $B = 10$

Substitute $B = 3A - 5$ into the second equation: $A + (3A - 5) = 15$, so $4A = 20$, $A = 5$. Then $B = 10$.

Question 10 Answer: $A = 4$, $B = 8$, $C = 12$

Express everything in terms of A : $A + 2A + 3A = 24$, so $6A = 24$, $A = 4$. Then $B = 8$, $C = 12$.