

Arithmetic Means MCQs - Exercise 6.3 (Class 11 Mathematics)

Prepared for Entry Test Preparation

Multiple Choice Questions

1. The A.M. between $2\sqrt{3}$ and $6\sqrt{3}$ is:
 - (a) $4\sqrt{3}$
 - (b) $3\sqrt{3}$
 - (c) $5\sqrt{3}$
 - (d) $2\sqrt{6}$
2. The A.M. between $2x - 5$ and $4x + 1$ is:
 - (a) $3x - 2$
 - (b) $3x + 2$
 - (c) $2x - 2$
 - (d) $2x + 2$
3. The A.M. between $x^2 - 2x + 1$ and $x^2 + 2x + 1$ is:
 - (a) $x^2 + 1$
 - (b) $x^2 - 1$
 - (c) $2x^2 + 1$
 - (d) $2x^2 - 1$
4. If 7 and 10 are two A.M.s between a and b , then a is:
 - (a) 1
 - (b) 2
 - (c) 3
 - (d) 4
5. If 7 and 10 are two A.M.s between a and b , then b is:
 - (a) 12
 - (b) 13
 - (c) 14
 - (d) 15
6. The first A.M. of five A.M.s between 3 and 9 is:
 - (a) $\frac{7}{2}$

- (b) 4
(c) $\frac{9}{2}$
(d) 5
7. The common difference for inserting 4 A.M.s between $\sqrt{5}$ and $5\sqrt{5}$ is:
(a) $\sqrt{5}$
(b) $\frac{\sqrt{5}}{2}$
(c) $\frac{2}{\sqrt{5}}$
(d) $\frac{4}{\sqrt{5}}$
8. The third A.M. of six A.M.s between 1 and 8 is:
(a) $\frac{22}{7}$
(b) $\frac{25}{7}$
(c) $\frac{28}{7}$
(d) $\frac{31}{7}$
9. The fourth A.M. of seven A.M.s between 2 and 10 is:
(a) $\frac{13}{2}$
(b) 6
(c) $\frac{11}{2}$
(d) $\frac{15}{2}$
10. The sum of three A.M.s between 5 and 13 is:
(a) 27
(b) 24
(c) 21
(d) 18
11. The value of n for which $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is the A.M. between a and b is:
(a) 0
(b) 1
(c) 2
(d) 3
12. The sum of five A.M.s between 4 and 16 is:
(a) 50
(b) 55
(c) 60

- (d) 65
13. The first A.M. of four A.M.s between $\frac{1}{\sqrt{2}}$ and $\frac{5}{\sqrt{2}}$ is:
- (a) $\sqrt{2}$
(b) $\frac{3}{\sqrt{2}}$
(c) $\frac{2}{\sqrt{2}}$
(d) $\frac{4}{\sqrt{2}}$
14. The common difference for inserting 8 A.M.s between -2 and 10 is:
- (a) $\frac{4}{3}$
(b) $\frac{3}{2}$
(c) $\frac{5}{4}$
(d) $\frac{2}{3}$
15. The second A.M. of three A.M.s between $x - 2$ and $x + 4$ is:
- (a) $x + 1$
(b) $x + 2$
(c) $x + 3$
(d) x
16. The sum of four A.M.s between $\sqrt{3}$ and $5\sqrt{3}$ is:
- (a) $12\sqrt{3}$
(b) $10\sqrt{3}$
(c) $8\sqrt{3}$
(d) $16\sqrt{3}$
17. If 6 is the A.M. between a and b , then $a + b$ is:
- (a) 10
(b) 12
(c) 14
(d) 16
18. The fifth A.M. of six A.M.s between $2x$ and $8x$ is:
- (a) $\frac{32x}{7}$
(b) $\frac{34x}{7}$
(c) $\frac{36x}{7}$
(d) $\frac{38x}{7}$
19. The common difference for inserting 5 A.M.s between $\frac{1}{2}$ and $\frac{7}{2}$ is:

(a) $\frac{1}{2}$

(b) $\frac{2}{3}$

(c) $\frac{1}{3}$

(d) $\frac{3}{5}$

20. The sum of n A.M.s between a and b divided by n equals:

(a) $\frac{a+b}{2}$

(b) $\frac{a+b}{n}$

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

(d) $\frac{a+b}{2n}$

Solutions and Explanations

1. **Answer: a** $4\sqrt{3}$ *Explanation:* A.M. = $\frac{2\sqrt{3}+6\sqrt{3}}{2} = \frac{8\sqrt{3}}{2} = 4\sqrt{3}$. Tests single A.M. (Ex. 6.3, Q1(i)).
2. **Answer: a** $3x - 2$ *Explanation:* A.M. = $\frac{(2x-5)+(4x+1)}{2} = \frac{6x-4}{2} = 3x - 2$. Tests A.M. with variables (Ex. 6.3, Q1(ii)).
3. **Answer: a** $x^2 + 1$ *Explanation:* A.M. = $\frac{(x^2-2x+1)+(x^2+2x+1)}{2} = \frac{2x^2+2}{2} = x^2 + 1$. Tests A.M. with quadratics (Ex. 6.3, Q1(iii)).
4. **Answer: d** 4 *Explanation:* Sequence: $a, 7, 10, b$. A.M. gives $7 = \frac{a+10}{2} \Rightarrow a = 4$. Tests multiple A.M.s (Ex. 6.3, Q2).
5. **Answer: b** 13 *Explanation:* Sequence: $a, 7, 10, b$. A.M. gives $10 = \frac{7+b}{2} \Rightarrow b = 13$. Tests multiple A.M.s (Ex. 6.3, Q2).
6. **Answer: b** 4 *Explanation:* Sequence: $3, A_1, \dots, A_5, 9$. $d = \frac{9-3}{5+1} = 1$. First A.M.: $A_1 = 3 + 1 = 4$. Tests inserting A.M.s (Ex. 6.3, Q3).
7. **Answer: a** $\sqrt{5}$ *Explanation:* Sequence: $\sqrt{5}, A_1, \dots, A_4, 5\sqrt{5}$. $d = \frac{5\sqrt{5}-\sqrt{5}}{4+1} = \frac{4\sqrt{5}}{5} = \frac{4\sqrt{5}}{5}$. Tests common difference (Ex. 6.3, Q4).
8. **Answer: c** $\frac{28}{7}$ *Explanation:* Sequence: $1, A_1, \dots, A_6, 8$. $d = \frac{8-1}{6+1} = 1$. Third A.M.: $A_3 = 1 + 3 \cdot 1 = 4$. Tests specific A.M. (Ex. 6.3, Q3).
9. **Answer: b** 6 *Explanation:* Sequence: $2, A_1, \dots, A_7, 10$. $d = \frac{10-2}{7+1} = 1$. Fourth A.M.: $A_4 = 2 + 4 \cdot 1 = 6$. Tests specific A.M. (Ex. 6.3, Q5).
10. **Answer: a** 27 *Explanation:* Sequence: $5, A_1, A_2, A_3, 13$. Sum of A.M.s = $3 \cdot \frac{5+13}{2} = 3 \cdot 9 = 27$. Tests sum of A.M.s (Ex. 6.3, Q8).
11. **Answer: b** 1 *Explanation:* $\frac{a^n+b^n}{a^{n-1}+b^{n-1}} = \frac{a+b}{2} \Rightarrow a^{n-1} = b^{n-1} \Rightarrow n = 1$. Tests A.M. of powers (Ex. 6.3, Q7).
12. **Answer: c** 60 *Explanation:* Sequence: $4, A_1, \dots, A_5, 16$. Sum of A.M.s = $5 \cdot \frac{4+16}{2} = 5 \cdot 10 = 50$. Tests sum of A.M.s (Ex. 6.3, Q8).

- 13. Answer: b** $\frac{3}{\sqrt{2}}$ *Explanation:* Sequence: $\frac{1}{\sqrt{2}}, A_1, \dots, A_4, \frac{5}{\sqrt{2}}$. $d = \frac{\frac{5}{\sqrt{2}} - \frac{1}{\sqrt{2}}}{5} = \frac{4}{5\sqrt{2}}$.
First A.M.: $A_1 = \frac{1}{\sqrt{2}} + \frac{4}{5\sqrt{2}} = \frac{9}{5\sqrt{2}}$. Tests A.M.s with radicals (Ex. 6.3, Q4).
- 14. Answer: a** $\frac{4}{3}$ *Explanation:* Sequence: $-2, A_1, \dots, A_8, 10$. $d = \frac{10 - (-2)}{8+1} = \frac{12}{9} = \frac{4}{3}$.
Tests common difference (Ex. 6.3, Q5).
- 15. Answer: a** $x+1$ *Explanation:* Sequence: $x-2, A_1, A_2, A_3, x+4$. $d = \frac{(x+4) - (x-2)}{4} = \frac{6}{4} = \frac{3}{2}$. Second A.M.: $A_2 = (x-2) + 2 \cdot \frac{3}{2} = x+1$. Tests A.M.s with variables (Ex. 6.3, Q6).
- 16. Answer: a** $12\sqrt{3}$ *Explanation:* Sequence: $\sqrt{3}, A_1, \dots, A_4, 5\sqrt{3}$. Sum of A.M.s
 $= 4 \cdot \frac{\sqrt{3} + 5\sqrt{3}}{2} = 4 \cdot 3\sqrt{3} = 12\sqrt{3}$. Tests sum of A.M.s (Ex. 6.3, Q8).
- 17. Answer: b** 12 *Explanation:* $6 = \frac{a+b}{2} \Rightarrow a+b = 12$. Tests single A.M. (Ex. 6.3, Q1).
- 18. Answer: d** $\frac{38x}{7}$ *Explanation:* Sequence: $2x, A_1, \dots, A_6, 8x$. $d = \frac{8x - 2x}{7} = \frac{6x}{7}$.
Fifth A.M.: $A_5 = 2x + 5 \cdot \frac{6x}{7} = \frac{44x}{7}$. Tests A.M.s with variables (Ex. 6.3, Q3).
- 19. Answer: a** $\frac{1}{2}$ *Explanation:* Sequence: $\frac{1}{2}, A_1, \dots, A_5, \frac{7}{2}$. $d = \frac{\frac{7}{2} - \frac{1}{2}}{6} = \frac{3}{6} = \frac{1}{2}$. Tests
common difference (Ex. 6.3, Q3).
- 20. Answer: a** $\frac{a+b}{2}$ *Explanation:* Sum of n A.M.s $= n \cdot \frac{a+b}{2}$. Divided by n , it equals
 $\frac{a+b}{2}$. Tests sum of A.M.s (Ex. 6.3, Q8).