

## Conceptual Multiple Choice Questions: Word Problems on Quadratic Equations (Exercise 4.10)

Class 11 Mathematics (Chapter 4)

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### MCQs

1. The positive number whose product of one less than itself and two less than three times itself is 14 is:
  - (a) 3
  - (b) 4
  - (c)  $-4/3$
  - (d) 2
2. The positive number whose sum with its square is 380 is:
  - (a) 19
  - (b)  $-20$
  - (c) 20
  - (d) 10
3. The two parts of 40 whose sum of squares is 100 more than twice their product are:
  - (a) 15, 25
  - (b) 10, 30
  - (c) 20, 20
  - (d) 12, 28
4. The number whose sum with its reciprocal is  $\frac{26}{5}$  is:
  - (a) 5
  - (b)  $\frac{1}{5}$
  - (c) 2
  - (d) 3
5. The number that exceeds its square root by 56 is:
  - (a) 64
  - (b) 49
  - (c) 36
  - (d) 81

6. The consecutive numbers whose product is 132 are:
- (a) 11, 12
  - (b) 10, 11
  - (c) 12, 13
  - (d) 9, 10
7. The consecutive even numbers whose difference of cubes is 296 are:
- (a) 6, 8
  - (b)  $-8, -6$
  - (c) 4, 6
  - (d) 8, 10
8. The number of sheep bought for Rs. 9000, where Rs. 100 less per sheep would allow 3 more sheep, is:
- (a) 15
  - (b) 12
  - (c) 18
  - (d) 10
9. The number of dozen eggs sold for Rs. 240, where 2 more dozen at Rs. 0.50 less per dozen yields the same, is:
- (a) 30
  - (b) 32
  - (c) 28
  - (d) 34
10. The time taken by a cyclist to travel Cervantes 48 km, if 2 km/h slower takes 2 hours more, is:
- (a) 6
  - (b) 8
  - (c) 4
  - (d) 10
11. The length of a rectangle with area  $297 \text{ m}^2$ , if 3 m longer and 1 m shorter gives  $300 \text{ m}^2$ , is:
- (a) 27
  - (b) 11
  - (c) 20
  - (d) 15

12. The original length of a rectangle whose breadth is 5 cm less, and cutting a 0.5 cm strip yields  $500 \text{ cm}^2$ , is:
- (a) 26
  - (b) 21
  - (c) 30
  - (d) 24
13. The two-digit number whose digits have product 18 and reversing digits reduces it by 27 is:
- (a) 63
  - (b) 36
  - (c) 72
  - (d) 27
14. The two-digit number whose digits have product 14 and reversing digits increases it by 45 is:
- (a) 27
  - (b) 72
  - (c) 14
  - (d) 41
15. The base of a right triangle with area  $210 \text{ m}^2$  and hypotenuse 37 m is:
- (a) 35
  - (b) 12
  - (c) 28
  - (d) 21
16. The breadth of a rectangle with area  $1680 \text{ m}^2$  and diagonal 58 m is:
- (a) 40
  - (b) 42
  - (c) 48
  - (d) 36
17. If A takes 10 days more than B to finish a job, and together they take 12 days, B takes:
- (a) 20
  - (b) 30
  - (c) 15
  - (d) 10

18. If A and B take 4 days together, and A takes twice as long as B, B takes:
- (a) 6
  - (b) 12
  - (c) 8
  - (d) 4
19. The side length of a square tin to make a box of 128 c.dm by cutting 2 dm squares is:
- (a) 12
  - (b) 8
  - (c) 10
  - (d) 16
20. The amount invested at  $y\%$  yielding Rs. 1980 from Rs. 100,000 with total profit Rs. 3080 is:
- (a) 44000
  - (b) 56000
  - (c) 50000
  - (d) 60000
21. The discriminant of the quadratic equation for  $x^2 + x - 380 = 0$  (Q.2) is:
- (a) 1521
  - (b) 1441
  - (c) 1600
  - (d) 1369

## Answers and Explanations

**1. Answer: a**

**Explanation:** Equation:  $(x - 1)(3x - 2) = 14 \Rightarrow 3x^2 - 5x - 12 = 0$ . Factors:  $(x - 3)(3x + 4) = 0 \Rightarrow x = 3, -\frac{4}{3}$ . Positive: 3. Option (a) is correct; others are incorrect.

**2. Answer: a**

**Explanation:** Equation:  $x^2 + x - 380 = 0$ . Factors:  $(x + 20)(x - 19) = 0 \Rightarrow x = 19, -20$ . Positive: 19. Option (a) is correct; others are incorrect.

**3. Answer: a**

**Explanation:** Equation:  $x^2 - 40x + 375 = 0$ . Factors:  $(x - 25)(x - 15) = 0 \Rightarrow x = 15, 25$ . Parts: 15, 25. Option (a) is correct; others do not satisfy.

**4. Answer: a**

**Explanation:** Equation:  $5x^2 - 26x + 5 = 0$ . Factors:  $(x - 5)(5x - 1) = 0 \Rightarrow x = 5, \frac{1}{5}$ . Option (a) is correct (one solution); others are incorrect.

**5. Answer: a**

**Explanation:** Equation:  $x^2 - 113x + 3136 = 0$ . Factors:  $(x - 64)(x - 49) = 0 \Rightarrow x = 64, 49$ . Only 64 satisfies  $x = \sqrt{x} + 56$ . Option (a) is correct.

**6. Answer: a**

**Explanation:** Equation:  $x^2 + x - 132 = 0$ . Factors:  $(x + 12)(x - 11) = 0 \Rightarrow x = 11, -12$ . Numbers: 11, 12. Option (a) is correct; others are incorrect.

**7. Answer: a**

**Explanation:** Equation:  $x^2 + 2x - 48 = 0$ . Factors:  $(x + 8)(x - 6) = 0 \Rightarrow x = 6, -8$ . Numbers: 6, 8. Option (a) is correct; others do not satisfy.

**8. Answer: a**

**Explanation:** Equation:  $x^2 + 3x - 270 = 0$ . Factors:  $(x + 18)(x - 15) = 0 \Rightarrow x = 15, -18$ . Number: 15. Option (a) is correct; others are incorrect.

**9. Answer: a**

**Explanation:** Equation:  $x^2 + 2x - 960 = 0$ . Factors:  $(x + 32)(x - 30) = 0 \Rightarrow x = 30, -32$ . Dozens: 30. Option (a) is correct; others are incorrect.

**10. Answer: a**

**Explanation:** Equation:  $t^2 + 2t - 48 = 0$ . Factors:  $(t + 8)(t - 6) = 0 \Rightarrow t = 6, -8$ . Time: 6 hours. Option (a) is correct; others are incorrect.

**11. Answer: a**

**Explanation:** Equations:  $xy = 297, x(y - 1) + 3y = 303$ . Solve:  $y^2 - 11y - 99 = 0 \Rightarrow y = 11 \Rightarrow x = 27$ . Option (a) is correct; others do not satisfy.

**12. Answer: a**

**Explanation:** Equation:  $x^2 - 7x - 494 = 0$ . Factors:  $(x - 26)(x + 19) = 0 \Rightarrow x = 26 \Rightarrow \text{breadth} = 21$ . Option (a) is correct; others are incorrect.

**13. Answer: a**

**Explanation:** Equations:  $xy = 18, x - y = 3$ . Solve:  $x^2 - 3x - 18 = 0 \Rightarrow x = 6 \Rightarrow y = 3$ . Number: 63. Option (a) is correct; others are incorrect.

**14. Answer: a**

**Explanation:** Equations:  $xy = 14, y - x = 5$ . Solve:  $x^2 + 5x - 14 = 0 \Rightarrow x = 2 \Rightarrow y = 7$ . Number: 27. Option (a) is correct; others are incorrect.

**15. Answer: a**

**Explanation:** Equations:  $xy = 420, x^2 + y^2 = 1369$ . Solve:  $y^4 - 1369y^2 + 176400 = 0 \Rightarrow y = 35, 12 \Rightarrow x = 12, 35$ . Base: 35. Option (a) is correct.

**16. Answer: a**

**Explanation:** Equations:  $xy = 1680, x^2 + y^2 = 3364$ . Solve:  $y^4 - 3364y^2 + 2822400 = 0 \Rightarrow y = 40, 42$ . Breadth: 40. Option (a) is correct.

**17. Answer: a**

**Explanation:** Equation:  $\frac{1}{x} + \frac{1}{x+10} = \frac{1}{12} \Rightarrow x^2 - 14x - 120 = 0 \Rightarrow x = 20, -6$ .  
B takes: 20. Option (a) is correct.

**18. Answer: a**

**Explanation:** Equation:  $\frac{1}{x} + \frac{1}{2x} = \frac{1}{4} \Rightarrow x = 6$ . B takes: 6. Option (a) is correct; others are incorrect.

**19. Answer: a**

**Explanation:** Equation:  $(x - 4)^2 = 64 \Rightarrow x = 12, -4$ . Side length: 12.  
Option (a) is correct; others are incorrect.

**20. Answer: a**

**Explanation:** Equations:  $xy = 198000, x = 100000y - 406000$ . Solve:  $50y^2 - 203y - 99 = 0 \Rightarrow y = 4.5 \Rightarrow x = 44000$ . Option (a) is correct.

**21. Answer: a**

**Explanation:** For  $x^2 + x - 380 = 0$ , discriminant:  $b^2 - 4ac = 1 + 1520 = 1521$ .  
Option (a) is correct; others are incorrect.