QUANTITATIVE APTITUDE

Algebra

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Quantitative Aptitude

Quantitative Aptitude is an important and highly scoring topic in **Competitive Exams** especially in **Bank Exams**. Quantitative Aptitude or Data Interpretation based questions are structured assessments that evaluate the talent and skills of the Candidates. It measures the problem-solving skills of the candidates so it has become an important part of Bank Exams.

Every bank exam includes Quantitative Aptitude in their Prelim and Mains Exams. Banks like **SBI, IBPS (for Clerk & PO), IBPS RRB and RBI Grade B** includes Quantitative Aptitude in their syllabus to examine the candidates' **Thinking power**. To understand the importance of Quantitative Aptitude let us have a look at the weightage of this topic in different banking exams.

Prelims and Mains Syllabus for Bank Exams

Prelims Syllabus	Mains Syllabus
✦ Number Series ✦ Data Interpretation ✦ Simplification/Approximation ✦ Quadratic Equation ✦ Data Sufficiency ✦ Mensuration ✦ Average ✦ Profit and Loss ✦ Ratio and Proportion ✦ Time and Work ✦ Time and Distance ✦ Probability ✦ Partnership ✦ Problem on Ages ✦ Simple and Compound Interest ✦ Permutation and Combination	✦ Simplification ✦ Average ✦ Percentage ✦ Ratio and Percentage ✦ Data Interpretation ✦ Mensuration and Geometry ✦ Quadratic Equation ✦ Interest ✦ Problems of Ages ✦ Profit and Loss ✦ Number Series ✦ Speed, Distance and Time ✦ Time and Work ✦ Number System ✦ Data Sufficiency ✦ Linear Equation ✦ Permutation and Combination ✦ Probability ✦ Mixture and Allegations

Quantitative Aptitude Algebra

1. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. $x^2 + 11x + 30 = 0$

II. $y^2 + 12y + 36 = 0$

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: C

Explanation:

I. $x^2 + 11x + 30 = 0$

⇒ $x^2 + 5x + 6x + 30 = 0$

⇒ x (x + 5) + 6 (x + 5) = 0

⇒ (x + 6) (x + 5) = 0

⇒ x = -6 or x = -5

II. $y^2 + 12y + 36 = 0$

⇒ (y + 6)2 = 0

⇒ (y + 6) = 0

⇒ y = -6

So, when x = -6, x = y for y = -6 and when x = -5, x > y for y = -6

∴ We can observe that x ≥ y.

2. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. 6x + 7y = 52

II. 14x + 4y = 35

A. 1 x > y

B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: B

Explanation:

I. 6x + 7y = 52

Multiplying on both sides by 4, we get,

⇒ 24x + 28y = 208 ----(1)

II. 14x + 4y = 35

Multiplying on both sides by 7, we get,

⇒ 98x + 28y = 245 ----(2)

Subtracting equation 1 from 2, we get,

⇒ 74x = 37

⇒ $x = +\frac{1}{2}$ ----(3)

⇒ x = + 0.5

Substituting equation 3 in equation 1, we get,

⇒ 3 + 7y = 52

⇒ 7y = 49

⇒ y = + 7

∴ We can observe that x < y.

3. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. 6x2 + 51x + 105 = 0

II. 2y2 + 25y + 78 = 0

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y

E. 5 x = y or relation cannot be established

Answer: A

Explanation:

I. 6x2 + 51x + 105 = 0

⇒ 6x2 + 21x + 30 x + 105 = 0

⇒ 3x (2x + 7) + 15 (2x + 7) = 0

⇒ (3x + 15) (2x + 7) = 0

⇒ x = - $\frac{15}{3}$ = - 5 or x = - $\frac{7}{2}$ = -3.5

II. 2y2 + 25y + 78 = 0

⇒ 2y2 + 12y + 13y + 78 = 0

⇒ 2y (y + 6) + 13 (y + 6) = 0

⇒ (2y + 13) (y + 6) = 0

⇒ y = - $\frac{13}{2}$ = -6.5 or y = -6

So, when x = -5, x > y for y = -6.5 and x > y for y = -6

And when x = -3.5, x > y for y = -6.5 and x > y for y = -6

∴ We can observe that x > y.

4. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer.

I. x = $\sqrt[3]{2744}$

II. y2 = 196

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: C

Explanation:

I. x = $\sqrt[3]{2744}$

⇒x= (14)3−−−−√3

⇒ x = 14

II. y2 = 196

⇒ y2 = (14)2

⇒ y = ± 14

So, when x = +14, x = y for y = +14 and x > y for y = -14

Also when x = +14, x = y for y = +14 and x > y for y = -14

∴ We can observe that relation between x and y is x ≥ y.

5. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. √1024 x + √4096 = 0

II. (16)1/4 y + (512) $\frac{1}{3}$ = 0

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: D

Explanation:

I. √1024 x + √4096 = 0

⇒ 32 x + 64 = 0

⇒ 32x = -64

⇒ x = -2

II. (16) $\frac{1}{4}$ y + (512) $\frac{1}{3}$ = 0

⇒ (2) $\frac{4}{4}$ y + (8) $\frac{3}{3}$ = 0

⇒ 2y + 8 = 0

⇒ y = - $\frac{8}{2}$ = - 4

∴ We can observe that x > y.

6. In the following question two equations are given. You have to solve these equations and determine relation between a and b.

I.a2+3=−189a+3349

II.10b2+193b6+41=−18+385b30

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: E

Explanation:

I.a2+3= $-\frac{189a+33}{49}$

⇒ 49a2 + 147 = -189a - 33

⇒ 49a2 + 189a + 180 = 0

⇒ 49a2 + 105a + 84a + 180 = 0

⇒ 7a (7a + 15) + 12(7a + 15) = 0

⇒ (7a + 12) (7a +15) = 0

Then, a = - $\frac{12}{7}$ = -1.714 or a = - $\frac{15}{7}$ = -2.14

II.10b2 + $\frac{193b}{6}$ +41= $-1\frac{18+385}{30}$

⇒10b2+ $\frac{193b}{6}$ +41= $-\frac{35-77b}{6}$

⇒10b2+$\frac{193b}{6}$ + $\frac{77b}{6}$+41+$\frac{3}{5}$ = 0

⇒10b2+ $\frac{270b}{6}$ + 41+ $\frac{3}{5}$ =0⇒

10b2+45b+41+ $\frac{3}{5}$ = 0

⇒ 50b2 + 225b + 205 + 3 = 0

⇒ 50b2 + 225b + 208 = 0

⇒ 50b2 + 160b + 65b + 208 = 0

⇒ 10b (5b + 16) + 13(5b + 16) = 0

⇒ (10b + 13) (5b + 16) = 0

Then, b = - $\frac{13}{10}$ = -1.3 or b = - $\frac{16}{5}$ = -3.2

So, when a = -1.714, a < b for b = -1.3 and a > b for b = -3.2

And when a = -2.14, a < b for b = -1.3 and a > b for b = -3.2

∴ So, we cannot determine the relationship between a and b.

7. In the following question two equations are given. You have to solve these equations and determine relation between a and b.

I. $\frac{286a^2}{15}$ −30a = − $\frac{286a^2}{15}$ −18+9a

II. $b^2 - \frac{158b}{63} = -\frac{11}{7}$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $\frac{286a^2}{15}$ −30a = − $\frac{286a^2}{15}$ −18+9a

II. $\frac{286a^2}{15}$ +14a215−30a−9a+18=0

⇒ $20a^2$ - 39a + 18 = 0

⇒ $20a^2$ - 24a - 15a + 18 = 0

⇒ 4a (5a - 6) - 3(5a - 6) = 0

⇒ (4a - 3) (5a - 6) =0

Then, a = + $\frac{3}{4}$ = + 0.75 or a = + $\frac{6}{5}$ = +1.2

II. $b^2 - \frac{158b}{63} = -\frac{11}{7}$

⇒ $b^2 - \frac{158b}{63}$ = − 9963

⇒ 63b2 - 158b + 99 = 0

⇒63b2 - 81b - 77b + 99 = 0

⇒9b (7b - 9) - 11(7b - 9) = 0

⇒(9b - 11) (7b - 9) = 0

Then, b = + $\frac{11}{9}$ = +1.222 or b = + $\frac{7}{9}$ = +1.286

So, when a = +0.75, a < b for b = +1.222 and a < b for b = +1.286

And when a = +1.2, a < b for b = +1.222 and a < b for b = +1.286

∴ So, we can observe that a < b.

8. Direction: In the following questions, two equations numbered are given in variables x and y. You have to solve both the equations and find out the relationship between x and y. Then give answer accordingly.

I. $\frac{3\sqrt{x}}{5} + \frac{3\sqrt{x}}{10} = \frac{9}{\sqrt{x}}$

II. $\frac{11}{\sqrt{y}} - \frac{1}{\sqrt{y}} = \sqrt{y}$

A. 1 if x > y
B. 2 if x ≥ y
C. 3 if x < y
D. 4 if x ≤ y
E. 5 if x = y or the relationship cannot be established

Answer: E

Explanation:

$\frac{3\sqrt{x}}{5} + \frac{3\sqrt{x}}{10} = \frac{9}{\sqrt{x}}$

Or, 9x = 90

⇒x = 10

II. $\frac{11}{\sqrt{y}} - \frac{1}{\sqrt{y}} = \sqrt{y}$

⇒y = 10

∴ x = y

9. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. a^2 - 16a = 0

II. b^2 + 27b = 0

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: D

Explanation:

I. $a^2 - 16a = 0$

$\Rightarrow a (a - 16) = 0$

Then, a = 0 or a = 16

II. $b^2 + 27b = 0$

$\Rightarrow b (b + 27) = 0$

Then, b = 0 or b = -27

So, when a = 0, a = b for b = 0 and a > b for b = -27

And when a = 16, a > b for b = 0 and a > b for b = -27

∴ So, we can observe that a ≥ b.

10. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. a^2 - 9a + 14 = 0

II. $3b^2$ + 9b + 6 = 0

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: B

Explanation:

I. $a^2 - 9a + 14 = 0$

$\Rightarrow a^2 - 7a - 2a + 14 = 0$

$\Rightarrow a (a - 7) - 2(a - 7) = 0$

$\Rightarrow (a - 2) (a - 7) = 0$

Then, a = 2 or a = 7

II. $3b^2 + 9b + 6 = 0$

$\Rightarrow 3b^2 + 3b + 6b + 6 = 0$

$\Rightarrow 3b (b + 1) + 6(b + 1) = 0$

$\Rightarrow (3b + 6) (b + 1) = 0$

Then, b = -2 or b = -1

So, when a = 2, a > b for b = -2 and a > b for b = -1

And when a = 7, a > b for b = -2 and a > b for b = -1

∴ So, we can observe that a > b.

11. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. $3a^2 - 22a + 40 = 0$

II. $b^2 + 15b + 54 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: B

Explanation:

I. $3a^2 - 22a + 40 = 0$

$\Rightarrow 3a^2 - 12a - 10a + 40 = 0$

$\Rightarrow 3a (a - 4) - 10(a - 4) = 0$

$\Rightarrow (3a - 10)(a - 4) = 0$

Then, $a = \frac{10}{3}$ or $a = 4$

II. $b^2 + 15b + 54 = 0$

$\Rightarrow b^2 + 9b + 6b + 54 = 0$

$\Rightarrow b(b + 9) + 6(b + 9) = 0$

$\Rightarrow (b + 6)(b + 9) = 0$

Then, b = -6 or b = -9

So, when $a = \frac{10}{3}$, a > b for b = -6 and a > b for b = -9

And when a = 4, a > b for b = -6 and a > b for b = -9

∴ So, we can observe that a > b.

12. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 20a + 64 = 0$

II. $b^2 - 60b + 116 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $a^2 + 20a + 64 = 0$

$\Rightarrow a^2 + 16a + 4a + 64 = 0$

$\Rightarrow a(a + 16) + 4(a + 16) = 0$

$\Rightarrow (a + 4)(a + 16) = 0$

Then, a = -4 or a = -16

II. $b^2 - 60b + 116 = 0$

$\Rightarrow b^2 - 58b - 2b + 116 = 0$

$\Rightarrow$b (b - 58) - 2(b - 58) = 0

$\Rightarrow$(b - 2) (b - 58) = 0

Then, b = 2 or b = 58

So, when a = -4 a < b for b = 2 and a < b for b = 58

And when a = -16, a < b for b = 2 and a < b for b = 58

∴ So, we can observe that a < b.

13. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $2a^2$ - 33a - 17 = 0

II. $22b^2$ + 15b + 2 = 0

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: E

Explanation:

I. $2a^2$ - 33a - 17 = 0

$\Rightarrow 2a^2$ - 34a + a - 17 = 0

$\Rightarrow$2a (a - 17) + 1(a - 17) = 0

$\Rightarrow$(2a + 1) (a - 17) = 0

Then, a = $-\frac{1}{2}$ or a = 17

II. $22b^2$ + 15b + 2 = 0

$\Rightarrow 22b^2$ + 11b + 4b + 2 = 0

$\Rightarrow$11b (2b + 1) + 2(2b + 1) = 0

$\Rightarrow$(11b + 2) (2b + 1) = 0

Then, b = $-\frac{2}{11}$ or b = $-\frac{1}{2}$

So, when a = - $\frac{1}{2}$ a < b for b = - $\frac{2}{11}$ and a = b for b = - $\frac{1}{2}$

And when a = 17, a > b for b = - $\frac{2}{11}$ and a > b for b = - $\frac{1}{2}$

∴ so, the relationship cannot be determined

14. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 10a + 25 = 0$

II. $b^2 - 22b - 75 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $a^2 + 10a + 25 = 0$

Use: $(a + b)^2$ = a2 + 2ab + b2

⇒$a^2 + 2 \times a \times 5 + 25 = 0$

⇒$(a + 5)^2 = 0$

Then, a = - 5

II. $b^2 - 22b - 75 = 0$

⇒$b^2 - 25b + 3b - 75 = 0$

⇒b (b - 25) + 3(b - 25) = 0

⇒(b + 3) (b - 25) = 0

Then, b = -3 or b = 25

So, when a = -5 a < b for b = -3 and a < b for b = 25

∴ So, we can observe that a < b.

15. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 23a + 76 = 0$

II. $b^2 - 65b + 784 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $a^2 + 23a + 76 = 0$

$\Rightarrow a^2 + 19a + 4a + 76 = 0$

$\Rightarrow a (a + 19) + 4(a + 19) = 0$

$\Rightarrow (a + 4) (a + 19) = 0$

Then, a = -4 or a = -19

II. $b^2 - 65b + 784 = 0$

$\Rightarrow b^2 - 49b - 16b + 784 = 0$

$\Rightarrow b (b - 49) - 16(b - 49) = 0$

$\Rightarrow (b - 49) (b - 16) = 0$

Then, b = 49 or b = 16

So, when a = -4 a < b for b = 49 and a < b for b = 16

And when a = -19, a < b for b = 49 and a < b for b = 16

∴ So, we can observe that a < b.

16. the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. $2a^2 + 28a + 98 = 0$

II. $9b^2 - 2b - 7 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b

D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $2a^2 + 28a + 98 = 0$

$\Rightarrow 2(a^2 + 14a + 49) = 0$

$\Rightarrow (a^2 + 14a + 49) = 0$

Use: $(a + b)^2 = a^2 + 2ab + b^2$

$\Rightarrow (a + 7)^2 = 0$

Then a = -7

II. $9b^2 - 2b - 7 = 0$

$\Rightarrow 9b^2 - 9b + 7b - 7 = 0$

$\Rightarrow 9b(b - 1) + 7(b - 1) = 0$

$\Rightarrow (9b + 7)(b - 1) = 0$

Then, $b = -\frac{7}{9}$ or b = 1

So, when a = -7 a < b for $b = -\frac{7}{9}$ and a < b for b = 1

∴ So, we can observe that a < b.

17. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $6a^2 + 11a - 7 = 0$

II. $b^2 - 43b + 82 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: A

Explanation:

I. $6a^2 + 11a - 7 = 0$

$\Rightarrow 6a^2 - 3a + 14a - 7 = 0$

$\Rightarrow 3a (2a - 1) + 7(2a - 1) = 0$

$\Rightarrow (3a + 7) (2a - 1) = 0$

Then, $a = -\frac{7}{3}$ or $a = \frac{1}{2}$

II. $b^2 - 43b + 82 = 0$

$\Rightarrow b^2 - 41b - 2b + 82 = 0$

$\Rightarrow b (b - 41) - 2(b - 41) = 0$

$\Rightarrow (b - 2) (b - 41) = 0$

Then, b = 2 or b = 41

So, when $a = -\frac{7}{3}$ a < b for b = 2 and a < b for b = 41

And when $a = \frac{1}{2}$, a < b for b = 2 and a < b for b = 41

∴ So, we can observe that a < b.

18. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $4a^2 - 32a = 0$

II. $44b^2 - 704 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: E

Explanation:

I. $4a^2 - 32a = 0$

$\Rightarrow 4a (a - 8) = 0$

$\Rightarrow a (a - 8) = 0$

Then, a = 0 or a = 8

II. $44b^2 - 704 = 0$

$\Rightarrow 44(b^2 - 16) = 0$

Use: $(a^2 - b^2) = (a + b)(a - b)$

$\Rightarrow b^2 - 16 = 0$

$\Rightarrow (b - 4)(b + 4) = 0$

Then, b = -4 or b = 4

So, when a = 0, a > b for b = -4 and a < b for b = 4

And when a = 8, a > b for b = -4 and a > b for b = 4

∴ So, the relationship cannot be determined

19. In the given question, two equations numbered I and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 40a + 256 = 0$

II. $b^2 - 64 = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: C

Explanation:

I. $a^2 + 40a + 256 = 0$

$\Rightarrow a^2 + 32a + 8a + 256 = 0$

$\Rightarrow a(a + 32) + 8(a + 32) = 0$

$\Rightarrow (a + 8)(a + 32) = 0$

Then, a = -8 or a = -32

II. $b^2 - 64 = 0$

Use: $(a^2 - b^2) = (a - b)(a + b)$

⇒(b + 8) (b - 8) = 0

Then, b = 8 or b = -8

So, when a = -8, a < b for b = 8 and a = b for b = -8

And when a = -32, a < b for b = 8 and a < b for b = -8

∴ So, we can observe that a ≤ b.

20. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 9a = 0$

II. $b^2 - 18b = 0$

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: C

Explanation:

I. $a^2 + 9a = 0$

⇒a (a + 9) = 0

Then, a = 0 or a = -9

II. $b^2 - 18b = 0$

⇒b (b - 18) = 0

Then, b = 0 or b = 18

So, when a = 0, a = b for b = 0 and a < b for b = 18

And when a = -9, a < b for b = 0 and a < b for b = 18

∴ So, we can observe that a ≤ b.

21. In the given question, two equations numbered l and II are given. You have to solve both the equations and mark the appropriate answer

I. $a^2 + 40a + 256 = 0$

II. b^2 - 64 = 0

A. 1 a < b
B. 2 a > b
C. 3 a ≤ b
D. 4 a ≥ b
E. 5 a = b or the relationship cannot be determined

Answer: C

Explanation:

I. $a^2 + 40a + 256 = 0$

$\Rightarrow a^2 + 32a + 8a + 256 = 0$

$\Rightarrow a (a + 32) + 8(a + 32) = 0$

$\Rightarrow (a + 8) (a + 32) = 0$

Then, a = -8 or a = -32

II. $b^2 - 64 = 0$

Use: (a2 - b2) = (a - b) (a + b)

$\Rightarrow (b + 8) (b - 8) = 0$

Then, b = 8 or b = -8

So, when a = -8, a < b for b = 8 and a = b for b = -8

And when a = -32, a < b for b = 8 and a < b for b = -8

∴ So, we can observe that a ≤ b.

22. In the following question two equations are given in variables 'x' and 'y'. On the basis of these equations you have to decide the relation between 'x' and 'y' and give answer.

I. $2x^2 - (4 + \sqrt{13})x + 2\sqrt{13} = 0$

II. $10y^2 - (18 + 5\sqrt{13})y + 9\sqrt{13} = 0$

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: C

Explanation:

I. 2x2 - (4 + √13) x + 2√13 = 0

⇒2x2 - 4x - √13 x + 2√13 = 0

⇒2x(x - 2) - √13(x - 2) = 0

⇒(2x - √13) (x - 2) = 0

⇒x = + $\frac{\sqrt{13}}{2}$ or x = +2

II. 10y2 - (18 + 5√13) y + 9√13 = 0

⇒$10y^2$ - 18y - 5√13 y + 9√13 = 0

⇒2y (5y - 9) - √13 (5y - 9) = 0

⇒(2y - √13) (5y - 9) = 0

⇒y = +√13/2 or y = + $\frac{9}{5}$

So, when x = +$\frac{\sqrt{13}}{2}$, x = y for y = + $\frac{\sqrt{13}}{2}$ and x > y for y = + $\frac{9}{5}$

And when x = +2, x > y for y = + $\frac{\sqrt{13}}{2}$ and x > y for y = + $\frac{9}{5}$

∴ we can observe that x ≥ y.

23. Direction: In the following questions, two equations numbered are given in variables x and y. You have to solve both the equations and find out the relationship between x and y. Then give answer accordingly.

I. $12x^2 + 11x + 12 = 10x^2 + 22x$

II. $13y^2 - 18y + 3 = 9y^2 - 10y$

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: C

Explanation:

I. $12x^2 + 11x + 12 = 10x^2 + 22x$

$\Rightarrow 12x^2 - 10x^2 + 11x - 22x + 12 = 0$

$\Rightarrow 2x^2 - 11x + 12 = 0$

$\Rightarrow 2x^2 - 8x - 3x + 12 = 0$

$\Rightarrow 2x(x - 4) - 3(x - 4) = 0$

$\Rightarrow (2x - 3) (x - 4) = 0$

$\Rightarrow x = \frac{3}{2} = +1.5$ or $x = +4$

II. $13y^2 - 18y + 3 = 9y^2 - 10y$

$\Rightarrow 13y^2 - 9y2 - 18y + 10y + 3 = 0$

$\Rightarrow 4y^2 – 2y - 6y + 3 = 0$

$\Rightarrow 2y (2y - 1) - 3(2y - 1) = 0$

$\Rightarrow (2y - 3) (2y - 1) = 0$

$\Rightarrow y = \frac{3}{2} = +1.5$ or $y = \frac{1}{2} = +0.5$

So, when x = +1.5, x = y for y = +1.5 and x > y for y = +0.5

24. In the following question two equations numbered I and II are given. You have to solve both the equations and give the answer:

I. $2x^2 – 11x + 15 = 0$

II. $21y^2 – 23y + 6 = 0$

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: A

Explanation:

I. $2x^2 – 11x + 15 = 0$

$\Rightarrow 2x^2 – 6x – 5x + 15 = 0$

$\Rightarrow 2x (x – 3) – 5 (x – 3) = 0$

$\Rightarrow (2x – 5) (x – 3) = 0$

Then, x = + $\frac{5}{2}$ = +2.5 or x = +3

II. $21y^2 - 23y + 6 = 0$

$\Rightarrow 21y^2 - 14y - 9y + 6 = 0$

$\Rightarrow 7y (3y - 2) - 3 (3y - 2) = 0$

$\Rightarrow (7y - 3) (3y - 2) = 0$

Then, y = + $\frac{3}{7}$ = +0.4 or y = + $\frac{2}{3}$= +0.6

So, when x = +2.5, x > y for y = +0.4 and x > y for y = +0.6

And when x = +3, x > y for y = +0.4 and x > y for y = +0.6

∴ We can observe that x > y.

And when x = +4, x > y for y = +1.5 and x > y for y = +0.5

∴ We can observe that x ≥ y.

25. In the following question two equations numbered I and II are given. You have to solve both the equations and give the answer:

I. $3x^2 + 13x + 12 = 0$

II. $y^2 + 9y + 20 = 0$

A. 1 x > y
B. 2 x < y
C. 3 x ≥ y
D. 4 x ≤ y
E. 5 x = y or relation cannot be established

Answer: A

Explanation:

I. $3x^2 + 13x + 12 = 0$

$\Rightarrow 3x^2 + 9x + 4x + 12 = 0$

$\Rightarrow 3x (x + 3) + 4 (x + 3) = 0$

$\Rightarrow (3x + 4) (x + 3) = 0$

Then, x = - $\frac{4}{3}$ = -1.3 or x = -3

II. $y^2 + 9y + 20 = 0$

$\Rightarrow y^2 + 5y + 4y + 20 = 0$

$\Rightarrow y(y + 5) + 4 (y + 5) = 0$

$\Rightarrow (y + 4) (y + 5) = 0$

Then, y = -4 or y =-5

So, when x = -1.3, x > y for y = -4 and x > y for y = -5

And when x =-3, x > y for y = -4 and x > y for y = -5

∴ We can observe that x > y.

26. On a school's Annual Day, apples were to be equally distributed amongst 112 children. But on that particular day 32 children were absent. Thus, the remaining children got 6 extra apples. How many apples was each child originally supposed to get?

A. 21
B. 12
C. 3 15
D. 4 Cannot be determined
E. None of these

Answer: C

Explanation:

Let every student was supposed to get n sweets

Then total number of sweets = 112 × n

Now, every student got 6 extra sweets so they got (n+6) sweets and 32 children were absent.

Now, total number of sweets = 80 × (n+6)

Hence,

112 × n = 80 × (n+6)

112n – 80n = 80 × 6

32n = 80 × 6

n = 15

27. A boy was asked to find $\frac{8}{9}$ th of a fraction. He made a mistake of dividing the fraction by $\frac{8}{9}$ and so got an answer which exceeds the correct answer by $\frac{17}{54}$. Find the original fraction?

A. $\frac{1}{2}$
B. $\frac{3}{4}$
C. $\frac{4}{3}$
D. $\frac{3}{5}$
E. None of these

Answer: C

Explanation:

28. The sum of three consecutive multiples of 4 is 444. Find the products of these three multiples.

A. 3239424
B. 2983680
C. 3464384
D. 3793920
E. 3109800

Answer: A

Explanation:

Let the first multiple be x

∴the second multiple will be x+4

The third multiple will be x+8

Sum = 444

∴x + x + 4 + x + 8 = 444

∴3x + 12 = 444

∴3x = 432

∴x = 144

∴ second multiple = 148

∴ Third multiple = 152

∴ Product = 144 × 148 × 152

= 3239424

Hence option (A)

29. Two hackers planned to hack a bank account which had debit card pin code in such a format that if a fraction could be made using the first two digits as numerator and last two digits as denominator, then if the numerator of the fraction was increased by 200% and the denominator by 300%, the fraction becomes $\frac{12}{15}$. What was the pin of the debit card?

A. 1 1889
B. 2 1660
C. 3 4850
D. 4 1890
E. 5 1615

Answer: E

30. The age of Mr. Ramesh is four times the age of his son. After ten years the age of Mr. Ramesh will be only twice the age of his son. Find the present age of Mr. Ramesh's son.

A. 10 years
B. 20 years
C. 5 years
D. Cannot be determined
E. None of these

Answer: C

Explanation:

Let, age of Ramesh be R, and that of his son be S.

∴ R = 4S -------------------------1

After 10 years, their ages will be (R + 10) and (S + 10) respectively.

∴ (R + 10) = 2(S + 10)

⇒R + 10 = 2S + 20

From 1,

⇒4S – 2S = 10

⇒S = 5

Present age of the son is 5 years.

31. A library has a fined charge for the first 3 days and an additional charge for each day thereafter Avanti paid Rs. 27 for a book kept for seven days if fined charges are Rs. x and thereafter charges are Rs. y per day. Write the linear equation representing the above information.

A. 4y + x = 27
B. 3y + x = 27
C. 3x + y = 27
D. 5x + y = 27
E. Insufficient information

Answer: A

Explanation:

Charges for the first 3 days = x

Charge of the remaining days = y

No. of days remaining = 7 – 3

= 4

∴total charge for reaming days = 4y

∴total charge for 7 days = x + 4y

∴equation ⇛x + 4y = 27

32. Raman has some 50-paisa coins, some 2-rupee coins, some 1-rupee coins and some 5-rupee coins. The value of all the coins is Rs. 50. Number of 2-rupee coins is 5 more than that of the 5 rupee coins. 50 paisa coins are double in number than 1 rupee coins. Value of 50-paisa coins and 1-rupee coins is Rs. 26. How many 2-rupee coins does he have?

A. 3
B. 5
C. 7
D. Cannot be determined
E. None of these

Answer: C

Explanation:

Number of 5 rupee coin = y, value = Rs. 5y

Number of 2 rupee coins = 5 + y, value = Rs. 10 + 2y

Number of 1 rupee coins = x, value = Rs. x

Number of 50 paisa coins = 2x, value = Rs. x

According to the problem, Value of 50-paisa coins and 1-rupee coins is Rs. 26

Hence, x + x = 26

$\Rightarrow x = 13$

Hence, number of 1 rupee coins = 13

Number of 50 paisa coins = 26

The value of all the coins is Rs. 50.

Hence, 26 + 5y + 10 + 2y = 50

$\Rightarrow 7y + 36 = 50$

$\Rightarrow 7y = 14$

$\Rightarrow y = 2$

Number of 2 rupee coins = y + 5 = 7

33. If $P^2+\frac{1}{P2}=7$, then find the value of $P^2-\frac{1}{P2}$.

A. 2–√5
B. 3–√5
C. 4–√5
D. 5–√5
E. None of these

Answer: B

Explanation:

$(a+b)^2=(a-b)^2+4ab \Rightarrow (P+\frac{1}{P})^2=(P-\frac{1}{P})^2+4$

Given expression:

$\Rightarrow P^2+\frac{1}{P2}=7$ -------------- (1)

Subtracting 2 from both sides, we get:

$\Rightarrow P^2+\frac{1}{P2}-2=7-2 \Rightarrow (P-\frac{1}{P})^2=5$

$\Rightarrow P-\frac{1}{P}=-\sqrt{5}$ -------------- (2)

Now adding 2 to both sides in equation (1) we get,

$\Rightarrow P^2+\frac{1}{P2}+2=7+2 \Rightarrow (P+\frac{1}{P})^2=9$

$\Rightarrow P+\frac{1}{P2}=3$ -------------- (3)

Formula: -

$(a+b)(a-b)= (a^2-b^2)$

Now, multiplying equations (2) and (3) we get,

⇒ $(P+\frac{1}{P})\ (P-\frac{1}{P2})\ =3-\sqrt{5}$

⇒ $P^2-\frac{1}{P2}=3-\sqrt{5}$

34. Mr. Arun is on tour and he has Rs. 360 for his expenses. If he exceeds his tour by 4 days, he must cut down his daily expenses by Rs. 3. For how many days is Mr. Arun out on tour?

A. 30
B. 15
C. 20
D. 45
E. None of these

Answer: C

35. The number of solutions of x2 + 4|x| + 5 = 0 is

A. 0
B. 2
C. 4
D. 1
E. 3

Answer: A

Explanation:

|x| is always positive.

The given equation is x2 + 4|x| + 5 = 0

∴ All the terms on the left hand side are positive.

Thus, it will never be equal to zero for any value of x.

∴ Number of roots of the given equation are 0.

36. Below question consists of two equations. On the basis of these two equations you have to find out the relation between p and q.

I. $p=\frac{\sqrt{4}}{\sqrt{9}}$

II. $9q^2 - 12q + 4 = 0$

A. p > q
B. q > p
C. p = q
D. p ≥ q
E. q ≥ p

Answer: C

Explanation:

$9q^2 – 12q + 4 = 0$

$\Rightarrow (3q – 2)^2 = 0$

$q = \frac{2}{3}$

Also, $p = \frac{\sqrt{4}}{\sqrt{9}}$

Hence $p = +\frac{2}{3}$

Hence we have p = q

37. Direction: In the following question two equations numbered I and II are given. You have to solve both the equations and give answers:

I: $x - \sqrt{121} = 0$

II: $y^2 - 121 = 0$

A. x > y
B. x ≥ y
C. x < y
D. x ≤ y
E. x = y or relation cannot be determined

Answer: B

Explanation:

From equation I:

$\Rightarrow x - \sqrt{121} = 0$

$\Rightarrow x = 11$

From equation II:

$\Rightarrow y^2 - 121 = 0$

$\Rightarrow y = \pm 11$

Comparing the values of x and y we get $x \geq y$

38. In following question, two equations are given, you have to solve them and choose the correct option:

$x^2 - 3x - 4 = 0$,

$y^2 - 4 = 0$

A. x = y or relation cannot be determined
B. x > y
C. x < y
D. x ≥ y
E. x ≤ y

Answer: A

Explanation:

$x^2 - 4x + x - 4 = 0$

$\Rightarrow x(x - 4) + 1(x - 4) = 0$

$\Rightarrow (x + 1)(x - 4) = 0$

$x = -1, x = 4$

$y^2 - 4 = 0$

$y^2 = 4$

$y = +2, -2$

$(x = 4) > y = (+2,-2)$ ---- (i)

$x = (-1) < y = 2$ ---- (ii)

Hence, relation cannot be determined.

39. In the following question, one or two equation(s) is/are given. You have to solve both the equations and find the relation between 'x' and 'y' and mark correct answer.

I. $\frac{2^5 + 11^3}{6} = x^3$

II. $4y^3 = -(589 \div 4) + 5y^3$

A. x > y
B. x ≥ y

C. x < y
D. x ≤ y
E. x = y or the relation cannot be determined

Answer: A

Explanation:

We will solve both the equations separately.

Equation I:

$\frac{2^5 + 11^3}{6} = x^3$

$\Rightarrow \frac{32+1331}{6} = x^3$

$\Rightarrow x^3 = \frac{1363}{6} = 227.167$

Equation II:

4y3 = - (589 ÷ 4) + 5y3

$\Rightarrow$4y3 = - $\frac{589}{4}$ + 5y3

$\Rightarrow$y3 = $\frac{589}{4}$ = 147.25

Comparing the values of x and y we get,

x > y

40. In the following question, one or two equation(s) is/are given. You have to solve both the equations and find the relation between 'l' and 'm' and mark correct answer.

I. $(729)^{\frac{1}{3}} \div 423 = 1$

II. $6 \times (3375)^{\frac{1}{3}} m - (3240000)^{\frac{1}{2}} = 36$

A. l > m
B. l ≥ m
C. l < m
D. l ≤ m
E. l = m or the relation cannot be determined

Answer: A

Explanation:

We will solve both the equations separately.

Equation I:

(729) $\frac{1}{3}$÷ 423 = 1

⇒$\frac{429^{\wedge}\frac{1}{3}}{423}$ =1

⇒9l = 423

⇒l = $\frac{423}{9}$ = 47

Equation II:

6 × (3375) $\frac{1}{3}$m – (3240000) $\frac{1}{2}$ = 36

⇒6 × 15m – 1800 = 36⇒90m = 36 + 180

⇒m = $\frac{1836}{90}$= 20.4

Comparing the values of l and m we get,

l > m

41. In the following question, one or two equation(s) is/are given. You have to solve both the equations and find the relation between 'a' and 'b' and mark correct answer.

I. a√25 + 2b = √961

II. 3a + (2401) $\frac{1}{4b}$ = 36

A. a > b
B. a ≥ b
C. a < b
D. a ≤ b
E. a = b or the relation cannot be determined

Answer: A

Explanation:

We will solve both the equations separately.

Equation I:

a√25 + 2b = √961

Here √25 can only be evaluated as 5

$\Rightarrow 5a + 2b = 31$

Equation II:

$3a + (2401)^{\frac{1}{4b}} = 36$

$\Rightarrow 3a + 7b = 36$

Multiplying the simplified values of equation (I) by 3 and that of (II) by 5, we get,

b = 3

Putting this value of y in the simplified value of equation (I), we get

a = 5

∴ a > b

42. In the following question, one or two equation(s) is/are given. On their basis, you have to determine the relation between p and q and then give answer

I. $2p^2 = 23p - 63$

II. $2q\ (q^{-8}) = q^{-36}$

A. p = q
B. p > q
C. p < q
D. p ≤ q
E. p ≥ q

Answer: B

Explanation:

Equation 1:

$2p^2 = 23p - 63$

$\Rightarrow 2p^2 - 14p - 9p + 63 = 0$

$\Rightarrow 2p\ (p - 7) - 9\ (p - 7) = 0$

$\Rightarrow (2p - 9)\ (p - 7) = 0$

$\Rightarrow 2p - 9 = 0$ and $p - 7 = 0$

$\Rightarrow p = \frac{9}{2}$ and 7

Equation 2:

2q (q-8) = q-36

⇒2q-7 = q-36

⇒2 q-7 × q36 = 1

⇒q29 = $\frac{1}{2}$

⇒q = ($\frac{1}{2}$) 29

Clearly, q < 1

And hence: p > q

43. In the following question, one or two equation(s) is/are given. You have to solve both the equations and find the relation between 'x' and 'y' and mark correct answer.

I. $(x\hat{}\frac{7}{5} \div 9) = 169 \div x\hat{}\frac{3}{5}$

II. $y\hat{}\frac{1}{4} \times y\hat{}\frac{1}{4} \times 7 = 273 \div y\hat{}\frac{1}{2}$

A. x > y
B. x ≥ y
C. x< y
D. x ≤ y
E. x = y or the relation cannot be determined

Answer: D

Explanation:

We will solve both the equations separately.

Equation I:

$(x\hat{}\frac{7}{5} \div 9) = 169 \div x\hat{}\frac{3}{5}$

$\Rightarrow\frac{(x)\hat{}\frac{7}{5}}{9}$ =169x35

$\Rightarrow x\hat{}\frac{10}{5} = 9 \times 169$

$\Rightarrow x^2 = 9 \times 169$

⇒x = + (3 × 13), - (3 × 13)

⇒x = +39 or – 39

Equation II:

$y^{\frac{1}{4}} * y^{\frac{1}{4}} * 7 = 273 \div y^{\frac{1}{2}}$

$y^{\frac{1}{4}} * y^{\frac{1}{4}} * 7 = \frac{273}{y^{\wedge}\frac{1}{2}}$

$\Rightarrow$y = $\frac{273}{7}$ = 39

Comparing the values of x and y we get,

x ≤ y

44. In the following question, two equations are given. You have to solve these equations and determine the relation between x and y.

I. 8x4 – 18x^2 + 4 = 0

II. 12y^2 + 29y + 14 = 0

A. x > y
B. x ≥ y
C. x < y
D. x ≤ y
E. x = y or the relation cannot be determined

Answer: E

Explanation:

We will solve both the equations separately.

Equation I:

8x4 – 18x2 + 4 = 0

Let x^2 = a

$\Rightarrow$8a^2 –18a + 4 = 0

$\Rightarrow$8a^2 – 16a – 2a + 4 = 0

$\Rightarrow$8a (a – 2) – 2(a – 2) = 0

$\Rightarrow$(8a - 2) (a - 2) = 0

$\Rightarrow$a = $\frac{1}{4}$ or a = 2

Since x = √a

$\therefore x = \pm\frac{1}{2} = \pm 0.5$ or, $x = \sqrt{2} = \pm 1.41$

Equation II:

12y2 + 29y + 14 = 0

⇒12y2 + 21y + 8y + 14 = 0

⇒3y (4y + 7) + 2(4y + 7) = 0

⇒(3y + 2) (4y + 7) = 0

⇒$y = -\frac{2}{3} = -0.67$ or $y = -\frac{7}{4} = -1.75$

Comparing the values of x and y, we get,

Few values of x are greater than y and few are smaller, same is true for y too. So, relation cannot be determined.

45. On multiplying the polynomials $x^2 + px + q$ and $x^2 + mx + n$ with each other, we get a polynomial whose zeroes are 1, 2, 3 and 4. What will be the value of (p + m) (q + n)?

A. -110
B. -140
C. -180
D. -210
E. Cannot be determined

Answer: E

Explanation:

Here, p, m, q and n could attain different values in different cases. For example, if $x^2 + px + q$ correspond to roots 1 and 2, and $x^2 + mx + n$ correspond to roots 3 and 4, then p = -3, q = 2, m = -7, n = 12. Here, (p + m)(q + n) = (-10)(14) = -140. And, if $x^2 + px + q$ correspond to roots 1 and 3, and $x^2 + mx + n$ correspond to roots 2 and 4, then p = -4, q = 3, m = -6, n = 8. Here, (p + m)(q + n) = (-10)(11) = -110.

We see that unique value of (p + m)(q + n) cannot be determined.

46. Given below are two quantities named A and B. Based on the given information, you have to determine the relation between the two quantities. You should use the given data and your knowledge of Mathematics to choose between the possible answers.

$0 < x < 1$

Quantity A: $(3x^3 - 9x)(5x + 7)$

Quantity B: $(3x^2 + 9)(5x^2 + 7x)$

A. Quantity A > Quantity B
B. Quantity A < Quantity B
C. Quantity A ≥ Quantity B
D. Quantity A ≤ Quantity B
E. Quantity A = Quantity B OR relationship cannot be determined.

Answer: B

Solution: 2

Notice that in each of the quantities, we can factor 3x out of the given expressions.

$0 < x < 1$

Quantity A: $(3x^3 - 9x)(5x + 7) = 3x(x^2 - 3)(5x + 7)$

Quantity B: $(3x^2 + 9)(5x^2 + 7x) = 3x(x^2 + 3)(5x + 7)$

Because we know that x is not 0, we can divide away 3x from both quantities.

Also, $0 < x < 1$, so $(5x + 7) \neq 0$, we can divide away $(5x + 7)$ from both quantities as well.

Quantity A: $3x(x^2 - 3)(5x + 7) = x^2 - 3$

Quantity B: $3x(x^2 + 3)(5x + 7) = x^2 + 3$

Since x^2 will always be positive, $(x^2 + 3)$ will always be bigger than $(x^2 – 3)$.

47. Given below are two quantities named A and B. Based on the given information, you have to determine the relation between the two quantities. You should use the given data and your knowledge of Mathematics to choose between the possible answers.

Quantity A: If a number is as much greater than 53 as it is less than 175, then the number:

Quantity B: If p= $\frac{5-q2}{p-q}$ and the value of p3 + q3 = 45 then the value of (p + q) $\frac{2}{3}$:

A. Quantity A > Quantity B
B. Quantity A < Quantity B
C. Quantity A ≥ Quantity B
D. Quantity A ≤ Quantity B
E. Quantity A = Quantity B

Answer: A

Explanation:

First we will find Quantity A,

Quantity A:

Let the number be ‘x’.

(x – 53) = (175 – x)

⇒x + x = 175 + 53

⇒x = $\frac{228}{2}$ = 114

∴ x = 114

Now,

Quantity B:

p=$\frac{5-q2}{p-q}$

⇒p (p – q) = 5 – q2

⇒p2 – pq + q2 = 5

⇒(p2 – pq + q2) = 5

We know that,

a3 + b3 = (a + b) (a2 – ab + b2)

Now,

p3 + q3 = (p + q) (p2 – pq + q2)

⇒45 = (p + q) × 5

⇒(p + q) = $\frac{45}{5}$= 9

∴ (p+q) $\frac{3}{2}$ = 9 $\frac{3}{2}$ = 27

∴ Quantity A > Quantity B

48. Find the largest positive integer n such that n3 + 1000, is divisible by n + 10. n^3 + 100 is also divisible by (n + 10).

A. 890
B. 920
C. 990
D. 940
E. None of these

Answer: A

Explanation:

We know that, $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

∴ $n^3 + 103 = n^3 + 1000 = (n + 10)(n^2 - 10n + 100)$

Thus, $(n + 10)$ divides $(n^3 + 1000)$.

Given equation,

$n^3 + 100 = (n^3 + 1000) - 900$

Since, $(n + 10)$ divides $(n^3 + 100)$ and $(n^3 + 1000)$, it must divide 900 also.

So, largest value of $(n + 10) = 900$

∴ $n = 890$

49. A polynomial f(x) = x4 – 11x3 + 31x2 – 46x + 20 is defined. When it is divided by x2 – 3x + n, the remainder left is q. Find the product of n and q.

A. 20
B. 30
C. 40
D. 50
E. 100

Answer: D

Explanation:

Let the quotient after division be $x^2 + ax + b$.

$\Rightarrow (x^2 - 3x + n)(x^2 + ax + b) + q = x4 - 11x^3 + 31x^2 - 46x + 20$

$\Rightarrow x^4 + (a - 3)x^3 + (n - 3a + b)x^2 + (an - 3b)x + bn + q = x4 - 11x^3 + 31x^2 - 46x + 20$

Comparing, we get a = -8, n – 3a + b = 31, an – 3b = -46, bn + q = 20.

Put value of a, we get n + b = 7, 8n + 3b = 46

Solving, we get n = 5, b = 2.

Now, bn + q = 20

$\Rightarrow q = 20 - 5 \times 2 = 10$

∴ Product of n and q will be 50.

50. Compare the values of the two quantities in the question and answer.

Quantity 1: Solve for x: ($49x^2$+ 84x + 36= 0)

Quantity 2: Solve for y: ($70y^2$ – 3y – 54 = 0)

A. Quantity 1 > Quantity 2
B. Quantity 1 < Quantity 2
C. Quantity 1 ≥ Quantity 2
D. Quantity 1 ≤ Quantity 2
E. Quantity 1 = Quantity 2

Answer: D

Explanation:

Solving for Quantity 1:

$\Rightarrow 49x^2 + 84x + 36 = 0$

$\Rightarrow 49x^2 + 42x + 42x + 36 = 0$

$\Rightarrow 7x(7x + 6) + 6(7x + 6) = 0$

$\Rightarrow (7x + 6)(7x + 6) = 0$

$\Rightarrow x = -\frac{6}{7}$

$\Rightarrow x = -0.86$

$\Rightarrow$ Quantity 1 = – 0.86

Solving for Quantity 2:

$\Rightarrow 70y^2 - 3y - 54 = 0$

$\Rightarrow 70y^2 + 60y - 63y - 54 = 0$

$\Rightarrow 10y(7y + 6) - 9(7y + 6) = 0$

$\Rightarrow (10y - 9)(7y + 6) = 0$

$\Rightarrow y = -\frac{6}{7}, \frac{9}{10}$

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