Quadratic Equation For IBPS RRB PO 2020 Prelims Exam

Quadratic Equations

Directions: In the following questions two equations numbered I and II are given. You have to solve both the equations and choose the correct option.

1. I. $x^2 + 35x + 276 = 0$

II. $y^2 + 23y + 132 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

2. I. $x^2 + 6x - 216 = 0$

II. $y^2 + 41y + 414 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

3. I. $x^2 - 19x + 84 = 0$

II. $y^2 - 10y - 39 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

4. I. $x^2 - 25x + 154 = 0$

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II. y^2 -32y +247 = 0

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

5. I. x^2 +2x -3 = 0

II. y^2 +31y +238 = 0

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

6. I. x^2 + 26x + 168 = 0

II. y^2 + 29y + 210 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

7. I. 20y – 13x = 40

II. 5x + 4y = 160

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

8. I. x^2 – 28x + 192 = 0

II. y^2 – 34y + 288 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

9. I. x^2 – x – 240 = 0

II. y^2– 5y – 204 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

10. I. x^2 + x – 240 = 0

II. y^2 – 17y + 60 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

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11. I. $x^2 + 2x – 48 = 0$

II. $y^2 – 17y + 66 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

12. I. $x^2 – 27x + 180 = 0$

II. $y^2 – 7y – 60 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

13. I. $x^2 + 36x + 320 = 0$

II. $y^2 – 6y – 315 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

14. I. $x^2 + 25x – 116 = 0$

II. $y^2 – 18y + 56 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

15. I. $2x^2 – 25x + 72 = 0$

II. $2y^2 + 3y – 54 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

16. I. $20x^2 + 48x – 5 = 0$

II. $2y^2 + 15y + 25 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

17. I. $x^2 -42x +437 = 0$

II. $y^2 -13y +42 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

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e) x = y or relationship cannot be established

18. I. x^2 +4x -221 = 0

II. y^2 +22y +85 = 0

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

19. I. $6x^2$ -5x -21 = 0

II. y^2 -28y +132 = 0

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

20. I. x^2 – 26x + 165 = 0

II. y^2 – 24y + 143 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

21. I. x^2 + x – 156 = 0

II. y^2– 32y + 240 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

22. I. x^2 + 26x + 153 = 0

II. y^2+ 36y + 324 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

23. I. x^2 – 30x + 189 = 0

II. y^2– 44y + 484 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

24. I. x^2 + 27x + 162 = 0

II. y^2 + 23y + 132 = 0

a) x> y

b) x< y

c) x = y or the relationship cannot be established

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d) x ≥ y

e) x ≤ y

25. I. $x^2 – 28x + 187 = 0$

II. $y^2 – 38y + 360 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

26. I. $x^2 – 11x – 26 = 0$

II. $4y^2 – 24y – 64 = 0$

a) x< y

b) x> y

c) x = y or the relationship cannot be determined

d) x ≥ y

e) x ≤ y

27. I. $2x^2 – 7x + 5 = 0$

II. $6y^2 – 5y + 1 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

28. I. $2x^2 – 7x + 5 = 0$

II. $2y^2 – 3y + 1 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

29. I. $5x^2 – 16x + 3 = 0$

II. $4y^2 + 11y – 3 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

30. I. $x^2 -21x +110 = 0$

II. $y^2 -26y +165 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

31. I. $x^2 – 36x + 323 = 0$

II. $y^2 – 11y – 102 = 0$

a) x> y

b) x< y

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c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

32. I. $x^2 – 26x + 160 = 0$

II. $y^2 – 23y + 120 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

33. I. $x^2 + 27x + 162 = 0$

II. $y^2 + 16y + 63 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

34. I. $x^2 – 33x + 270 = 0$

II. $y^2 – 22y + 117 = 0$

a) x> y

b) x< y

c) x = y or the relationship cannot be established

d) x ≥ y

e) x ≤ y

35. I. $3x^2 – 31x – 104 = 0$

II. $2y^2 – 29y – 48 = 0$

a) x< y

b) x> y

c) x = y OR the relationship cannot be determined

d) x ≥ y

e) x ≤ y

36. I. $8x^2 - 15x + 7 = 0$

II. $y^2 - 7y + 6 = 0$

a) x> y

b) x< y

c) x ≥ y

d) x ≤ y

e) x = y or relation cannot be established

37. I. $3x^2 – 8x + 4 = 0$

II. $6y^2 – 5y + 1 = 0$

a) x> y

b) x< y

c) x ≥ y

d) x ≤ y

e) x = y or no relationship could be established

38. I. $5x^2 + 6x + 1 = 0$

II. $y^2 + 3y – 4 = 0$

a) x ≤ y

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b) x> y

c) x< y

d) x = y or relationship between x and y cannot be established.

e) x ≥ y

39. I. $x^2 + 15x + 56 = 0$

II. $y^2 - 23y + 132 = 0$

a) x< y

b) x ≤ y

c) x> y

d) x ≥ y

e) x = y or the relationship cannot be established.

40. I. $7x^2 – 39x + 20 = 0$

II. $5y^2 + 3y – 2 = 0$

a) x> y

b) x ≥ y

c) x< y

d) x ≤ y

e) x = y or the relationship cannot be established

41. I. $x^2 -6x -27 = 0$

II. $y^2 -43y +460 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

42. I. $x^2 -7x -120 = 0$

II. $y^2 -33y +270 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

43. I. $x^2 -41x +418 = 0$

II. $y^2 -5y -266 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

44. I. $x^2 -5x -300 = 0$

II. $y^2 -37y +340 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

45. I. $2a^2 - 13a + 20 = 0$

II. $2b^2 - 5b + 3 = 0$

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a) a< b

b) a> b

c) a ≤ b

d) a ≥ b

e) a = b or the relationship cannot be determined

46. I. $34a^2 + 44a + 10 = 0$

II. $18b^2 + 26b + 8 = 0$

a) a< b

b) a> b

c) a ≤ b

d) a ≥ b

e) a = b or the relationship cannot be determined

47. I. $x^2 + 4x - 252 = 0$

II. $y^2 - 34y + 280 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

48. I. $x^2 - 38x + 352 = 0$

II. $y^2 + 7y - 368 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

49. I. $x^2 + 28x + 160 = 0$

II. $y^2 + 3y - 304 = 0$

a) x< y

b) x> y

c) x ≤ y

d) x ≥ y

e) x = y or relationship cannot be established

50. I. $2x^2 - 15x + 27 = 0$

II. $3y^2 - 11y + 6 = 0$

a) x > y

b) x < y

c) x ≥ y

d) x ≤ y

e) x = y or relation cannot be established

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Solutions with Explanation

1. Answer: C)

From equation I:

$x^2 + 35x + 276 = (x + 12)(x + 23) = 0$

=> x = -12, -23

From equation II:

$y^2 + 23y + 132 = (y + 11)(y + 12) = 0$

=> y = -11, -12

	X = -12	X = -23
Y = -11	x < y	x < y
Y = -12	x = y	x < y

So, $x \leq y$

2. Answer: D)

From equation I:

$x^2 + 6x - 216 = (x + 18)(x - 12) = 0$

=> x = -18, 12

From equation II:

$y^2 + 41y + 414 = (y + 23)(y + 18) = 0$

=> y = -23, -18

	X = -18	X = 12
Y = -23	x > y	x > y
Y = -18	x = y	x > y

So, $x \geq y$

3. Answer: E)

From equation I:

$x^2 - 19x + 84 = (x - 12)(x - 7) = 0$

=> x = 12, 7

From equation II:

$y^2 - 10y - 39 = (y + 3)(y - 13) = 0$

=> y = -3, 13

	X = 12	X = 7
Y = -3	x > y	x > y
Y = 13	x < y	x < y

So, relationship cannot be established between x and y

4. Answer: E)

From equation I:

$x^2 - 25x + 154 = (x - 11)(x - 14) = 0$

=> x = 11, 14

From equation II:

$y^2 - 32y + 247 = (y - 13)(y - 19) = 0$

=> y = 13, 19

	X = 11	X = 14
Y = 13	x < y	x > y
Y = 19	x < y	x < y

So, relationship cannot be established between x and y

5. Answer: B)

From equation I:

$x^2 + 2x - 3 = (x + 3)(x - 1) = 0$

=> x = -3, 1

From equation II:

$y^2 + 31y + 238 = (y + 17)(y + 14) = 0$

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=> y = -17, -14

	X = -3	X = 1
Y = -17	x > y	x > y
Y = -14	x > y	x > y

So, x > y

6. Answer: D)

From I:

$x^2 + 26x + 168 = 0$

$x^2 + 12x + 14x + 168 = 0$

$x(x + 12) + 14(x + 12) = 0$

$(x + 12)(x + 14) = 0$

$x = -12, -14$

From II:

$y^2 + 29y + 210 = 0$

$y^2 + 14y + 15y + 210 = 0$

$y(y + 14) + 15(y + 14) = 0$

$(y + 14)(y + 15) = 0$

$y = -14, -15$

X	Relation	Y
-12	>	-14
-12	>	-15
-14	=	-14
-14	>	-15

So, $x \geq y$.

7. Answer: A)

From I:

$20y - 13x = 40$

$20y = (40 + 13x)$

$y = (40 + 13x)/20$

From II:

$5x + 4y = 160$

Putting value of y from (I),

$5x + (40 + 13x)/5 = 160$

$25x + 40 + 13x = 800$

$38x = 760$

$x = 20$

$y = (40 + 260)/20 = 15$

Therefore, $y < x$.

8. Answer: E)

From I:

$x^2 - 28x + 192 = 0$

$x^2 - 16x - 12x + 192 = 0$

$x(x - 16) - 12(x - 16) = 0$

$(x - 12)(x - 16) = 0$

$x = 12, 16$

From II:

$y^2 - 34y + 288 = 0$

$y^2 - 16y - 18y + 288 = 0$

$y(y - 16) - 18(y - 16) = 0$

$(y - 16)(y - 18) = 0$

$y = 16, 18$

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X	Relation	Y
12	<	16
12	<	18
16	=	16
16	<	18

So $x \leq y$

9. Answer: C)

From I:

$x^2 - x - 240 = 0$

$x^2 - 16x + 15x - 240 = 0$

$x(x - 16) + 15(x - 16) = 0$

$(x - 16)(x + 15) = 0$

$x = 16, -15$

From II:

$y^2 - 5y - 204 = 0$

$y^2 - 17y + 12y - 204 = 0$

$y(y - 17) + 12(y - 17) = 0$

$(y + 12)(y - 17) = 0$

$y = -12, 17$

X	Relation	Y
16	>	-12
16	<	17
-15	<	-12
-15	<	17

So, no relation can be established between x and y.

10. Answer: C)

From I:

$x^2 + x - 240 = 0$

$x^2 - 15x + 16x - 240 = 0$

$x(x - 15) + 16(x - 15) = 0$

$(x - 15)(x + 16) = 0$

$x = 15, -16$

From II:

$y^2 - 17y + 60 = 0$

$y^2 - 12y - 5y + 60 = 0$

$y(y - 12) - 5(y - 12) = 0$

$(y - 12)(y - 5) = 0$

$y = 12, 5$

X	Relation	Y
15	>	12
15	>	5
-16	<	12
-16	<	5

Therefore, no relation can be established between x and y.

11. Answer: E)

From I:

$x^2 + 2x - 48 = 0$

$x^2 - 6x + 8x - 48 = 0$

$x(x - 6) + 8(x - 6) = 0$

$(x - 6)(x + 8) = 0$

$x = 6, -8$

From II:

$y^2 - 17y + 66 = 0$

$y^2 - 11y - 6y + 66 = 0$

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$y(y - 11) - 6(y - 11) = 0$

$(y - 11)(y - 6) = 0$

$y = 11, 6$

X	Relation	y
6	=	6
6	<	11
-8	<	6
-8	<	11

Therefore, $x \leq y$

12. Answer: D)

From I:

$x^2 - 27x + 180 = 0$

$x^2 - 12x - 15x + 180 = 0$

$x(x - 12) - 15(x - 12) = 0$

$(x - 12)(x - 15) = 0$

$x = 12, 15$

From II:

$y^2 - 7y - 60 = 0$

$y^2 - 12y + 5y - 60 = 0$

$y(y - 12) + 5(y - 12) = 0$

$(y - 12)(y + 5) = 0$

$y = 12, -5$

X	Relation	y
12	=	12
12	>	-5
15	>	12
15	>	-5

Therefore, $x \geq y$

13. Answer: B)

From I:

$x^2 + 36x + 320 = 0$

$x^2 + 16x + 20x + 320 = 0$

$x(x + 16) + 20(x + 16) = 0$

$(x + 16)(x + 20) = 0$

$x = -16, -20$

From II:

$y^2 - 6y - 315 = 0$

$y^2 - 21y + 15y - 315 = 0$

$y(y - 21) + 15(y - 21) = 0$

$(y - 21)(y + 15) = 0$

$y = 21, -15$

X	Relation	y
-16	<	-15
-16	<	21
-20	<	-15
-20	<	21

Therefore, $x < y$

14. Answer: E)

I. $x^2 + 25x - 116 = 0$

$\Rightarrow x^2 + 29x - 4x - 116 = 0$

$\Rightarrow x(x + 29) - 4(x + 29) = 0$

$\Rightarrow (x + 29)(x - 4) = 0$

Then, $x = -29$ or $x = +4$

II. $y^2 - 18y + 56 = 0$

$\Rightarrow y^2 - 14y - 4y + 56 = 0$

$\Rightarrow y(y - 14) - 4(y - 14) = 0$

$\Rightarrow (y - 14)(y - 4) = 0$

Then, y = + 14 or y = + 4

So, when x = - 29, x < y for y = + 14 and x < y for y = + 4

And when x = + 4, x < y for y = + 14 and x = y for y = + 4

∴So, we can observe that $x \leq y$.

15. Answer: D)

I. $2x^2 - 25x + 72 = 0$

$\Rightarrow 2x^2 - 16x - 9x + 72 = 0$

$\Rightarrow 2x(x - 8) - 9(x - 8) = 0$

$\Rightarrow (x - 8)(2x - 9) = 0$

Then, x = + 8 or x = + 9/2

II. $2y^2 + 3y - 54 = 0$

$\Rightarrow 2y^2 + 12y - 9y - 54 = 0$

$\Rightarrow 2y(y + 6) - 9(y + 6) = 0$

$\Rightarrow (y + 6)(2y - 9) = 0$

Then, y = - 6 or y = + 9/2

So, when x = + 8, x > y for y = - 6 and x > y for y = + 9/2

And when x = + 9/2, x > y for y = - 6 and x = y for y = + 9/2

∴So, we can clearly observe that $x \geq y$.

16. Answer: D)

I. $20x^2 + 48x - 5 = 0$

$\Rightarrow 20x^2 + 50x - 2x - 5 = 0$

$\Rightarrow 10x(2x + 5) - 1(2x + 5) = 0$

$\Rightarrow (2x + 5)(10x - 1) = 0$

Then, x = - 5/2 or x = 1/10

II. $2y^2 + 15y + 25 = 0$

$\Rightarrow 2y^2 + 10y + 5y + 25 = 0$

$\Rightarrow 2y(y + 5) + 5(y + 5) = 0$

$\Rightarrow (y + 5)(2y + 5) = 0$

Then, y = - 5 or y = - 5/2

So, when x = - 5/2, x > y for y = - 5 and x = y for y = - 5/2

And when x = 1/10, x > y for y = - 5 and x > y for y = - 5/2

∴So, we can observe that $x \geq y$.

17. Answer: B)

From equation I:

$x^2 - 42x + 437$

$= (x - 23)(x - 19) = 0$

=> x = 23, 19

From equation II:

$y^2 - 13y + 42 = (y - 7)(y - 6) = 0$

=> y = 7, 6

	X = 23	X = 19
Y = 7	x > y	x > y
Y = 6	x > y	x > y

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So, x > y

18. Answer: E)

From equation I:

$x^2 + 4x - 221 = (x + 17)(x - 13) = 0$

=> x = -17, 13

From equation II:

$y^2 + 22y + 85 = (y + 5)(y + 17) = 0$

=> y = -5, -17

	X = -17	X = 13
Y = -5	x < y	x > y
Y = -17	x = y	x > y

So, relationship cannot be established between x and y

19. Answer: A)

From equation I:

$6x^2 - 5x - 21 = (2x + 3)(3x - 7) = 0$

=> x = -3/2, 7/3

From equation II:

$y^2 - 28y + 132 = (y - 6)(y - 22) = 0$

=> y = 6, 22

	X = -3/2	X = 7/3
Y = 6	x < y	x < y
Y = 22	x < y	x < y

So, x < y

20. Answer: C)

From I:

$x^2 - 26x + 165 = 0$

$x^2 - 11x - 15x + 165 = 0$

$x(x - 11) - 15(x - 11) = 0$

$(x - 11)(x - 15) = 0$

x = 11, 15

From II:

$y^2 - 24y + 143 = 0$

$y^2 - 13y - 11y + 143 = 0$

$y(y - 13) - 11(y - 13) = 0$

$(y - 13)(y - 11) = 0$

y = 13, 11

X	Relation	Y
11	<	13
11	=	11
15	>	13
15	>	11

So, no relation can be established between x and y.

21. Answer: E)

From I:

$x^2 + x - 156 = 0$

$x^2 - 12x + 13x - 156 = 0$

$x(x - 12) + 13(x - 12) = 0$

$(x + 13)(x - 12) = 0$

x = -13, 12

From II:

$y^2 - 32y + 240 = 0$

$y^2 - 12y - 20y + 240 = 0$

$y(y - 12) - 20(y - 12) = 0$

$(y - 20)(y - 12) = 0$

$y = 20, 12$

X	Relation	Y
-13	<	20
-13	<	12
12	<	20
12	=	12

So, $y \geq x$

22. Answer: A)

From I:

$x^2 + 26x + 153 = 0$

$x^2 + 9x + 17x + 153 = 0$

$x(x + 9) + 17(x + 9) = 0$

$(x + 9)(x + 17) = 0$

$x = -9, -17$

From II:

$y^2 + 36y + 324 = 0$

$y^2 + 18y + 18y + 324 = 0$

$y(y + 18) + 18(y + 18) = 0$

$(y + 18)(y + 18) = 0$

$y = -18, -18$

X	Relation	Y
-9	>	-18
-9	>	-18
-17	>	-18
-17	>	-18

So $x > y$.

23. Answer: B)

From I:

$x^2 - 30x + 189 = 0$

$x^2 - 21x - 9x + 189 = 0$

$x(x - 21) - 9(x - 21) = 0$

$(x - 21)(x - 9) = 0$

$x = 21, 9$

From II:

$y^2 - 44y + 484 = 0$

$y^2 - 22y - 22y + 484 = 0$

$y(y - 22) - 22(y - 22) = 0$

$(y - 22)(y - 22) = 0$

$y = 22, 22$

X	Relation	Y
21	<	22
21	<	22
9	<	22
9	<	22

So $x < y$

24. Answer: C)

From I:

$x^2 + 27x + 162 = 0$

$x^2 + 9x + 18x + 162 = 0$

$x(x + 9) + 18(x + 9) = 0$

$(x + 18)(x + 9) = 0$

$x = -18, -9$

From II:

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$y^2 + 23y + 132 = 0$

$y^2 + 12y + 11y + 132 = 0$

$y(y + 12) + 11(y + 12) = 0$

$(y + 12)(y + 11) = 0$

$y = -12, -11$

X	Relation	Y
-18	<	-12
-18	<	-11
-9	>	-12
-9	>	-11

So, no relation can be established between x and y.

25. Answer: B)

From I:

$x^2 – 28x + 187 = 0$

$x^2 – 17x – 11x + 187 = 0$

$x(x – 17) – 11(x – 17) = 0$

$(x – 17)(x – 11) = 0$

$x = 17, 11$

From II:

$y^2 – 38y + 360 = 0$

$y^2 – 18y – 20y + 360 = 0$

$y(y – 18) – 20(y – 18) = 0$

$(y –18)(y – 20) = 0$

$y = 18, 20$

X	Relation	Y
17	<	18
17	<	20
11	<	18
11	<	20

So, x < y

26. Answer: C)

I. $x^2 – 11x – 26 = 0$

$\Rightarrow x^2 – 13x + 2x – 26 = 0$

$\Rightarrow x(x – 13) + 2(x – 13) = 0$

$\Rightarrow (x – 13)(x + 2) = 0$

Then, x = + 13 or x = - 2

II. $4y^2 – 24y – 64 = 0$

$\Rightarrow y^2 – 6y – 16 = 0$ [Dividing both sides by 4]

$\Rightarrow y^2 – 8y + 2y – 16 = 0$

$\Rightarrow y(y – 8) + 2(y – 8) = 0$

$\Rightarrow (y – 8)(y + 2) = 0$

Then, y = + 8 or y = - 2

So, when x = + 13, x > y for y = + 8 and x > y for y = - 2

And when x = - 2, x < y for y = + 8and x = y for y = - 2

∴So, we can observe that no clear relationship cannot be determined between x and y.

27. Answer: B)

I. $2x^2 – 7x + 5 = 0$

$\Rightarrow 2x^2 – 5x – 2x + 5 = 0$

$\Rightarrow x(2x – 5) – 1(2x – 5) = 0$

$\Rightarrow (2x – 5)(x – 1) = 0$

Then, x = + 5/2 or x = + 1

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II. $6y^2 – 5y + 1 = 0$

$\Rightarrow 6y^2 – 3y – 2y + 1 = 0$

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

$\Rightarrow (2y – 1)(3y – 1) = 0$

Then, y = + ½ or y = + 1/3

So, when x = + 5/2, x > y for y = + ½ and x > y for y = + 1/3

And when x = + 1, x > y for y = + ½ and x > y for y = + 1/3

∴We can clearly see that x> y.

28. Answer: D)

I. $2x^2 – 7x + 5 = 0$

$\Rightarrow 2x^2 – 5x – 2x + 5 = 0$

$\Rightarrow x(2x – 5) – 1(2x – 5) = 0$

$\Rightarrow (2x – 5)(x – 1) = 0$

Then, x = + 5/2 or x = + 1

II. $2y^2 – 3y + 1 = 0$

$\Rightarrow 2y^2 – 2y – y + 1 = 0$

$\Rightarrow 2y(y – 1) – 1(y – 1) = 0$

$\rightarrow (y – 1)(2y – 1) = 0$

Then, y = + 1 or y = + ½

So, when x = + 5/2, x > y for y = + 1 and x > y for y = + ½

And when x = + 1, x = y for y = + 1 and x > y for y = + ½

∴So, we can clearly observe that $x \geq y$.

29. Answer: C)

I. $5x^2 – 16x + 3 = 0$

$\Rightarrow 5x^2 – 15x – x + 3= 0$

$\Rightarrow 5x(x – 3) – 1(x – 3) = 0$

$\Rightarrow (x – 3)(5x – 1) = 0$

Then, x = + 3 or x = + 1/5

II. $4y^2 + 11y – 3 = 0$

$\Rightarrow 4y^2 + 12y – y – 3 = 0$

$\Rightarrow 4y(y + 3) – 1(y + 3) = 0$

$\Rightarrow (y + 3)(4y – 1) = 0$

Then, y = - 3 or y = + 1/4

So, when x = + 3, x > y for y = - 3 and x > y for y = + ¼

And when x = + 1/5, x > y for y = - 3 and x < y for y = + ¼

∴So, we can observe that no clear relationship cannot be determined between x and y.

30. Answer: C)

From equation I:

x^2 -21x +110 = (x -10)(x -11)= 0

=> x = 10, 11

From equation II:

y^2 -26y +165 = (y -15)(y -11) = 0

=> y = 15, 11

	X = 10	X = 11
Y = 15	x < y	x < y
Y = 11	x < y	x = y

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So, $x \leq y$

31. Answer: D)

From I:

$x^2 - 36x + 323 = 0$

$x^2 - 19x - 17x + 323 = 0$

$x(x - 19) - 17(x - 19) = 0$

$(x - 17)(x - 19) = 0$

$x = 17, 19$

From II:

$y^2 - 11y - 102 = 0$

$y^2 - 17y + 6y - 102 = 0$

$y(y - 17) + 6(y - 17) = 0$

$(y - 17)(y + 6) = 0$

$y = 17, -6$

X	Relation	Y
17	=	17
17	>	-6
19	>	17
19	>	-6

So, $x \geq y$

32. Answer: C)

From I:

$x^2 - 26x + 160 = 0$

$x^2 - 16x - 10x + 160 = 0$

$x(x - 16) - 10(x - 16) = 0$

$(x - 16)(x - 10) = 0$

$x = 10, 16$

From II:

$y^2 - 23y + 120 = 0$

$y^2 - 15y - 8y + 120 = 0$

$y(y - 15) - 8(y - 15) = 0$

$(y - 15)(y - 8) = 0$

$y = 15, 8$

X	Relation	Y
10	<	15
10	>	8
16	>	15
16	>	8

So, no relation can be established between x and y

33. Answer: E)

From I:

$x^2 + 27x + 162 = 0$

$x^2 + 9x + 18x + 162 = 0$

$x(x + 9) + 18(x + 9) = 0$

$(x + 9)(x + 18) = 0$

$x = -9, -18$

From II:

$y^2 + 16y + 63 = 0$

$y^2 + 7y + 9y + 63 = 0$

$y(y + 7) + 9(y + 7) = 0$

$(y + 7)(y + 9) = 0$

$y = -7, -9$

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X	Relation	Y
-9	=	-9
-9	<	-7
-18	<	-9
-18	<	-7

So, $x \leq y$

34. Answer: A)

From I:

$x^2 - 33x + 270 = 0$

$x^2 - 15x - 18x + 270 = 0$

$x(x - 15) - 18(x - 15) = 0$

$(x - 15)(x - 18) = 0$

$x = 15, 18$

From II:

$y^2 - 22y + 117 = 0$

$y^2 - 9y - 13y + 117 = 0$

$y(y - 9) - 13(y - 9) = 0$

$(y - 9)(y - 13) = 0$

$y = 9, 13$

X	Relation	Y
15	>	9
15	>	13
18	>	9
18	>	13

So, $x > y$

35. Answer: C)

I. $3x^2 - 31x - 104 = 0$

$\Rightarrow 3x^2 - 39x + 8x - 104 = 0$

$\Rightarrow 3x(x - 13) + 8(x - 13) = 0$

$\Rightarrow (x - 13)(3x + 8) = 0$

Then, $x = +13$ or $x = -8/3$

II. $2y^2 - 29y - 48 = 0$

$\Rightarrow 2y^2 - 32y + 3y - 48 = 0$

$\Rightarrow 2y(y - 16) + 3(y - 16) = 0$

$\Rightarrow (y - 16)(2y + 3) = 0$

Then, $y = +16$ or $y = -3/2$

So, when $x = +13$, $x < y$ for $y = +16$ and $x > y$ for $y = -3/2$

And when $x = -8/3$, $x < y$ for $y = +16$ and $x < y$ for $y = -3/2$

∴So, we can observe that no clear relationship cannot be determined between x and y.

36. Answer: D)

I. $8x^2 - 15x + 7 = 0$

$\Rightarrow 8x^2 - 8x - 7x + 7 = 0$

$\Rightarrow 8x(x - 1) - 7(x - 1) = 0$

$\Rightarrow (8x - 7)(x - 1) = 0$

Then, $x = +7/8 = +0.875$ or $x = +1$

II. $y^2 - 7y + 6 = 0$

$\Rightarrow y^2 - 6y - 1y + 6 = 0$

$\Rightarrow y(y - 6) - 1(y - 6) = 0$

$\Rightarrow (y - 1)(y - 6) = 0$

Then, $y = 1$ or $y = 6$

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So, when x = + 0.875, x < y for y = + 1 and x < y for y = + 6

And when x = + 1, x = y for y = + 1 and x < y for y = + 6

∴So, we can observe that x ≤ y.

37. Answer: A)

I. $3x^2 – 8x + 4 = 0$

⇒ $3x^2 – 6x – 2x + 4 = 0$

⇒ $3x(x – 2) – 2(x – 2) = 0$

⇒ $(3x – 2) (x – 2) = 0$

⇒ x = 2/3, 2

II. $6y^2 – 5y + 1 = 0$

⇒ $6y^2 – 3y – 2y + 1 = 0$

⇒ $3y (2y – 1) – 1(2y – 1) = 0$

⇒ $(2y – 1) (3y – 1) = 0$

⇒ y = 1/2, 1/3

When x = 2/3, y = 1/2, then x > y

When x = 2/3, y = 1/3, then x > y

When x = 2, y = 1/2, then x > y

When x = 2, y = 1/3, then x > y

∴x and y are related as x > y

38. Answer: D)

Solving the equation for x:

$5x^2 + 6x + 1 = 0$

Formula for roots = $\{-b \pm \sqrt{(b^2 – 4ac)}\}/2a$

⇒ Roots = $\{-(6) \pm \sqrt{(\{[6]^2 – 4 \times 5 \times 1)}\}/(2 \times 5)$

⇒ Roots = $\{-6 \pm \sqrt{16}\}/(2 \times 5)$

⇒ Roots = $\{-6 \pm 4\}/10$

⇒ Roots = -10/10 or -2/10

⇒ Roots = -1 or -1/5

Solving the equation for y:

⇒ $y^2 + 3y – 4 = 0$

⇒ $y^2 + 4y - y – 4 = 0$

⇒$y(y + 4) – 1(y + 4) = 0$

⇒ y = -4 or y = 1

When x = −1, y = -4 then x > y

When x = −1, y = 1 then x < y

When x = −1/5, y = -4 then x > y

When x = -1/5, y = 1 then x < y

∴ x = y or relationship cannot be established

39. Answer: A)

I. $x^2 + 15x + 56 = 0$

⇒$x^2 + 7x + 8x + 56 = 0$

⇒$x(x + 7) + 8(x + 7) = 0$

⇒ $(x + 7)(x + 8) = 0$

Then, x = -7 or x = -8

II. $y^2-23y + 132 = 0$

⇒ $y^2 – 11y – 12y + 132 = 0$

⇒$y(y – 11) – 12(y – 11) = 0$

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⇒ (y – 11)(y – 12) = 0

Then, y = +11 or y = +12

So, when x = -7, x < y for y = +11 and x < y for y = +12

And when x = -8, x < y for y = +11 and x < y for y = +12

∴We can clearly observe that x < y.

40. Answer: A)

Equation: 1

⇒ $7x^2 – 39x + 20 = 0$

⇒ $7x^2 – 35x – 4x + 20 = 0$

⇒ 7x(x – 5) – 4(x – 5) = 0

⇒ (x – 5)(7x – 4) = 0

⇒ x = 5 or x = 4/7

Equation: 2

⇒ $5y^2 + 3y – 2 = 0$

⇒ $5y^2 + 5y – 2y – 2 = 0$

⇒ 5y(y + 1) – 2(y + 1) = 0

⇒ y = -1 or y = 2/5

∴ x > y

41. Answer: A)

From equation I:

x^2 -6x -27 = (x + 3)(x -9)= 0

=> x = -3, 9

From equation II:

y^2 -43y +460 = (y -23)(y -20) = 0

=> y = 23, 20

	X = -3	X = 9
Y = 23	x < y	x < y
Y = 20	x < y	x < y

So, x < y

42. Answer: C)

From equation I:

x^2 -7x -120 = (x + 8)(x -15)= 0

=> x = -8, 15

From equation II:

y^2 -33y +270 = (y -15)(y -18) = 0

=> y = 15, 18

	X = -8	X = 15
Y = 15	x < y	x = y
Y = 18	x < y	x < y

So, x ≤ y

43. Answer: D)

From equation I:

x^2 -41x +418 = (x -19)(x -22)= 0

=> x = 19, 22

From equation II:

y^2 -5y -266 = (y -19)(y + 14) = 0

=> y = 19, -14

	X = 19	X = 22
Y = 19	x = y	x > y
Y = -14	x > y	x > y

So, x ≥ y

44. Answer: E)

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From equation I:

x^2 -5x -300 = (x + 15)(x -20)= 0

=> x = -15, 20

From equation II:

y^2 -37y +340 = (y -17)(y -20) = 0

=> y = 17, 20

	X = -15	X = 20
Y = 17	x < y	x > y
Y = 20	x < y	x = y

So, relationship cannot be established between x and y

45. Answer: B)

I. $2a^2$ - 13a + 20 = 0

⇒ $2a^2$ - 8a - 5a + 20 = 0

⇒2a(a - 4) - 5(a - 4) = 0

⇒ (2a - 5)(a - 4) = 0

Then, a = 2.5 or a = 4

II. $2b^2$ - 5b + 3 = 0

⇒ $2b^2$ - 2b - 3b + 3 = 0

⇒2b(b - 1) - 3(b - 1) = 0

⇒ (2b - 3)(b - 1) = 0

Then, b = 1 or b = 1.5

So, when a = 2.5, a > b for both b = 1 and 1.5

And when a = 4, a > b for both b = 1 and 1.5

∴So, we can observe that a > b.

46. Answer: E)

I. $34a^2$ + 44a + 10 = 0

⇒ 2($17a^2$ + 22a + 5) = 0

⇒ $17a^2$ + 17a + 5a + 5 = 0

⇒17a(a + 1) + 5(a + 1) = 0

⇒ (17a + 5)(a + 1) = 0

Then, a = -5/17 or a = -1

II. $18b^2$ + 26b + 8 = 0

⇒ $18b^2$ + 18b + 8b + 8 = 0

⇒18b(b + 1) + 8(b + 1) = 0

⇒ (18b + 8)(b + 1) = 0

Then, b = -8/18 or b = -1

So, when a = -5/17, a > b for b = -8/18 and a > b for b = -1

And when a = -1, a < b for b = -8/18 and a = b for b = -1

∴So, the relationship cannot be determined.

47. Answer: C)

From equation I:

x^2 +4x -252 = (x -14)(x + 18)= 0

=> x = 14, -18

From equation II:

y^2 -34y +280 = (y -20)(y -14) = 0

=> y = 20, 14

	X = 14	X = -18
Y = 20	x < y	x < y
Y = 14	x = y	x < y

So, x ≤ y

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48. Answer: D)

From equation I:

$x^2 - 38x + 352 = (x - 16)(x - 22) = 0$

=> x = 16, 22

From equation II:

$y^2 + 7y - 368 = (y + 23)(y - 16) = 0$

=> y = -23, 16

	X = 16	X = 22
Y = -23	x > y	x > y
Y = 16	x = y	x > y

So, $x \geq y$

49. Answer: E)

From equation I:

$x^2 + 28x + 160 = (x + 8)(x + 20) = 0$

=> x = -8, -20

From equation II:

$y^2 + 3y - 304 = (y - 16)(y + 19) = 0$

=> y = 16, -19

	X = -8	X = -20
Y = 16	x < y	x < y
Y = -19	x > y	x < y

So, relationship cannot be established between x and y

50. Answer: C)

Equation I:

$2x^2 - 15x + 27 = 0$

$\Rightarrow 2x^2 - 6x - 9x + 27 = 0$

$\Rightarrow 2x(x - 3) - 9(x - 3) = 0$

$(2x - 9)(x - 3) = 0$

x = 3, 9/2

Equation II:

$3y^2 - 11y + 6 = 0$

$3y^2 - 9y - 2y + 6 = 0$

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

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

y = 2/3, 3

Thus, x = 3, 9/2 and y = 2/3, 3

Comparing these values of x and y, we get $x \geq y$

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