QUANTITATIVE APTITUDE Quadratic Equations

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1. Find the roots of the quadratic equation: $X^{2}+2 x-15=0$ ?
A. $-5,3$
B. 3,5
C. $-3,5$
D. $-3,-5$
E. 5, 2

## Answer: A

## Explanation:

$X^{2}+5 x-3 x-15=0$
$X(x+5)-3(x+5)=0$
$(x-3)(x+5)=0$
$\Rightarrow x=3$ or $x=-5$.
2. Find the roots of the quadratic equation: $2 x 2+3 x-9=0$ ?
A. $3,-3 / 2$
B. $3 / 2,-3$
C. $-3 / 2,-3$
D. $3 / 2,3$
E. $2 / 3,-3$

Answer: B

Explanation:
$2 x 2+6 x-3 x-9=0$
$2 x(x+3)-3(x+3)=0$
$(x+3)(2 x-3)=0$
$=>x=-3$ or $x=3 / 2$.
3. The roots of the equation $3 \times 2-12 x+10=0$ are?
A. rational and unequal
B. complex
C. real and equal
D. irrational and unequal
E. rational and equal

## Explanation:

The discriminant of the quadratic equation is (-12)2-4(3) (10) i.e., 24. As this is positive but not a perfect square, the roots are irrational and unequal.

## 4. If the roots of a quadratic equation are 20 and $-\mathbf{7}$, then find the equation?

A. $X^{2}+13 x-140=0$
B. $x^{2}-13 x+140=0$
C. $X^{2}-13 x-140=0$
D. $X^{2}+13 x+140=0$
E. None of these

Answer: C

## Explanation:

Any quadratic equation is of the form
$X^{2}-($ sum of the roots) $x+($ product of the roots $)=0---$ (1)
Where $x$ is a real variable. As sum of the roots is 13 and product of the roots is -140 , the quadratic equation with roots as 20 and -7 is:
$x^{2}-13 x-140=0$.
5. The sum and the product of the roots of the quadratic equation $X^{2}+20 x+3=0$ are?
A. 10,3
B. $-10,3$
C. $20,-3$
D. $-10,-3$
E. None of these

## Answer: E

Explanation: Sum of the roots and the product of the roots are -20 and 3 respectively.
6. $x^{2}-32 x+252=0$
$y^{2}-28 y+192=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

## Explanation:

$x^{2}-32 x+252=0$
$x=18,14$
$y^{2}-28 y+192=0$
$y=12,16$
7. $x^{2}-32 x+247=0$

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

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: C.
Explanation:
$x^{2}-32 x+247=0$
$x=13,19$
$y^{2}-22 y+117=0$
$y=13,9$
8. $x^{2}+29 x+208=0$

$$
y^{2}+19 y+78=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.
Explanation:
$x^{2}+29 x+208=0$
$x=-13,-16$
$y^{2}+19 y+78=0$

$$
y=-13,-6
$$

9. $x^{2}-22 x+105=0$

$$
y^{2}-27 y+162=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

## Explanation:

$x^{2}-22 x+105=0$
$x=15,7$
$y^{2}-27 y+162=0$
$y=18,9$
10. $(x-18)^{2}=0$
$y^{2}=324$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

## Answer: C.

Explanation:
$x^{2}-36 x+324=0$
$x=18,18$
$\mathrm{y}^{2}=324$
$y= \pm 18$
11. $2 x^{2}+20 x+50=0$

$$
2 y^{2}+22 y+56=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

## Answer: E.

Explanation:
$2 x^{2}+20 x+50=0$
$x^{2}+10 x+25=0$
$x=-5$
$2 y^{2}+22 y+56=0$
$y=-4,-7$
12. $2 x^{2}-13 x+21=0$
$y^{2}-33 y+272=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: B.

Explanation:
$2 x^{2}-13 x+21=0$
$x=3.5,3$
$y^{2}-33 y+272=0$
$y=16,17$
13. $x^{2}-29 x+208=0$

$$
y^{2}+9 y+14=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: A.

Explanation:
$x^{2}-29 x+208=0$
$x=13,16$
$y^{2}+9 y+14=0$
$y=-2,-7$
14. $x^{2}-25 x+156=0$

$$
y^{2}-65 y+676=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.

Explanation:
$x^{2}-25 x+156=0$
$x=13,12$
$y^{2}-65 y+676=0$
$y=13,52$
15. $2 x^{2}-7 x+6=0$
$2 y^{2}-9 y+10=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.

Explanation:
$2 x^{2}-7 x+6=0$
$x=1.5,2$
$2 y^{2}-9 y+10=0$
$y=2,2.5$
16. $x^{2}-39 x+324=0$
$y^{2}-47 y+420=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$x^{2}-39 x+324=0$
$x=27,12$
$y^{2}-47 y+420=0$
$y=35,12$
17. $x^{2}-31 x+240=0$

$$
y^{2}-29 y+210=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: C.

Explanation:
$x^{2}-31 x+240=0$
$x=15,16$
$y^{2}-29 y+210=0$
$y=15,14$
18. $x^{2}+40 x+391=0$

$$
y^{2}-20 y-525=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

## Answer: B.

## Explanation:

$x^{2}+40 x+391=0$
$x=-23,-17$
$y^{2}-20 y-525=0$
$y=35,-15$
19. $4 x^{2}+19 x+21=0$
$3 y^{2}+29 y+56=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$4 x^{2}+19 x+21=0$
$x=-3,-1.75$
$3 y^{2}+29 y+56=0$
$y=-7,-2.6$
20. $x^{2}-16 x+63=0$
$6 y^{2}-29 y+35=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: A.
Explanation:
$x^{2}-16 x+63=0$
$x=7,9$
$6 y^{2}-29 y+35=0$
$y=2.3,2.5$
21. $x^{2}-34 x+288=0$
$y^{2}-28 y+192=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: C.
Explanation:
$x^{2}-34 x+288=0$
$x=18,16$
$y^{2}-28 y+192=0$
$y=12,16$
22. $x^{2}-26 x+168=0$
$y^{2}-32 y+252=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.
Explanation:
$x^{2}-26 x+168=0$
$x=12,14$
$y^{2}-32 y+252=0$
$y=14,18$
23. $x^{2}+26 x+168=0$
$y^{2}+23 y+132=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.

Explanation:
$x^{2}+26 x+168=0$
$x=-12,-14$
$y^{2}+23 y+132=0$
$y=-12,-11$
24. $x^{2}-28 x+195=0$

$$
y^{2}-30 y+216=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$x^{2}-28 x+195=0$
$x=15,13$
$y^{2}-30 y+216=0$
$y=18,12$
25. $(x-19)^{2}=0$

$$
y^{2}=361
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\quad X=Y$ or relation cannot be established

## Answer: C.

Explanation:
$x^{2}-38 x+361=0$
$x=19,19$
$y^{2}=361$
$y= \pm 19$
26. $x^{2}-44 x+448=0$

$$
y^{2}-28 y+195=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: A.

Explanation:
$x^{2}-44 x+448=0$
$x=28,16$
$y^{2}-28 y+195=0$
$y=13,15$
27. $x^{2}-26 x+168=0$
$y^{2}-34 y+285=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: B.
Explanation:
$x^{2}-26 x+168=0$
$x=12,14$
$\mathrm{y}^{2}-34 \mathrm{y}+285=0$
$y=15,19$
28. $x^{2}-38 x+352=0$

$$
y^{2}-25 y+154=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: A.
Explanation:
$x^{2}-38 x+352=0$
$x=22,16$
$y^{2}-25 y+154=0$
$y=11,14$
29. $x^{2}=121$
$y^{2}-46 y+529=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: B.
Explanation:
$X^{2}=121$
$x=11,-11$
$y^{2}-46 y+529=0$
$y=23,23$
30. $x^{2}-31 x+234=0$
$y^{2}-34 y+285=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$x^{2}-31 x+234=0$
$x=13,18$
$y^{2}-34 y+285=0$
$y=15,19$
31. $x^{2}-32 x+252=0$

$$
y^{2}-28 y+192=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$x^{2}-32 x+252=0$
$x=18,14$
$y^{2}-28 y+192=0$
$y=12,16$
32. $x^{2}-32 x+247=0$

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

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\quad X=Y$ or relation cannot be established

## Answer: C.

## Explanation:

$x^{2}-32 x+247=0$
$x=13,19$
$y^{2}-22 y+117=0$
$y=13,9$
33. $x^{2}+29 x+208=0$

$$
y^{2}+19 y+78=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.

Explanation:
$x^{2}+29 x+208=0$
$x=-13,-16$
$y^{2}+19 y+78=0$
$y=-13,-6$
34. $x^{2}-22 x+105=0$
$y^{2}-27 y+162=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.
Explanation:
$x^{2}-22 x+105=0$
$x=15,7$
$\mathrm{y}^{2}-27 \mathrm{y}+162=0$
$y=18,9$
35. $(x-18)^{2}=0$
$y^{2}=324$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: C.
Explanation:
$x^{2}-36 x+324=0$
$x=18,18$
$y^{2}=324$
$y= \pm 18$
36. $x^{2}-41 x+400=0$
$y^{2}-29 y+210=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: A.
Explanation:
$x^{2}-41 x+400=0$
$x=25,16$
$y^{2}-29 y+210=0$
$y=14,15$
37. $x^{2}-25 x+156=0$
$y^{2}-32 y+255=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: B.
Explanation:
$x^{2}-25 x+156=0$
$x=12,13$
$y^{2}-32 y+255=0$
$y=15,17$
38. $x^{2}-35 x+294=0$

$$
y^{2}-23 y+132=0
$$

A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: A.
Explanation:
$x^{2}-35 x+294=0$
$x=21,14$
$y^{2}-23 y+132=0$
$y=11,12$
39. $x^{2}=64$
$y^{2}-34 y+289=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: B.
Explanation:
$X^{2}=64$
$x=8,-8$
$y^{2}-34 y+289=0$
$y=17,17$
40. $x^{2}-29 x+208=0$
$y^{2}-32 y+255=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.
Explanation:
$x^{2}-29 x+208=0$
$x=13,16$
$\mathrm{y}^{2}-32 \mathrm{y}+255=0$
$y=15,17$
41. $X^{2}-18 \mathrm{x}+72=0,5 Y^{2}-18 \mathrm{y}+9=0$
A. If $X>Y$
B. If $X<Y$
C. If $X \geq Y$
D. If $X \leq Y$
E. If $X=Y$ or relation cannot be established

## Answer: A

## Explanation:

$X^{2}-18 x+72=0$
$(X-12)(X-6)=0$

Gives $x=6,12$
$5 Y^{2}-18 y+9=0$
$5 Y^{2}-15 y-3 y+9=0$

Gives $y=3 / 5,3$

Put on number line
$\begin{array}{llll}3 / 5 & 3 & 6 & 12\end{array}$
42. $X^{2}=4,3 Y^{2}-4 y-4=0$
A. If $X>Y$
B. If $X<Y$
C. If $X \geq Y$
D. If $X \leq Y$
E. If $X=Y$ or relation cannot be established

Answer: E

Explanation:
$X^{2}=4$

Gives $x=2,-2$
$3 Y^{2}-4 y-4=0$
$3 Y^{2}-6 y+2 y-4=0$
Gives $y=-2 / 3,2$

Put on number line
$\begin{array}{lll}-2 & -2 / 3 & 2\end{array}$

When $\mathrm{y}=2, \mathrm{y} \geq \mathrm{x}$

When $y=-2 / 3, y>x(-2)$ and $y<x(2)$

So no relation
43. $6 X^{2}-5 x-6=0$,
$2 Y^{2}-13 y+20=0$
A. If $X>Y$
B. If $X<Y$
C. If $X \geq Y$
D. If $X \leq Y$
E. If $X=Y$ or relation cannot be established

## Answer: B

Explanation:
$6 X^{2}-5 x-6=0$
$6 X^{2}-9 x+4 x-6=0$

Gives $x=-2 / 3,3 / 2$
$2 Y^{2}-13 y+20=0$
$2 Y^{2}-8 y-5 y+20=0$
Gives $y=4,5 / 2$
Put on number line
$\begin{array}{llll}-2 / 3 & 3 / 2 & 5 / 2 & 4\end{array}$
44. $2 X^{2}-5 x=0,2 Y^{2}+7 y-4=0$
A. If $X>Y$
B. If $X<Y$
C. If $X \geq Y$
D. If $X \leq Y$
E. If $X=Y$ or relation cannot be established

Answer: E

Explanation:
$2 X^{2}-5 x=0$
$x(2 x-5)=0$

Gives $x=0,5 / 2$
$3 Y^{2}-7 y-6=0$
$3 Y^{2}-9 y+2 y-6=0$
Gives $y=-2 / 3,3$
Put on number line
$-2 / 3 \quad 0 \quad 5 / 2$
3
45. $2 X^{2}+5 x+2=0,2 Y^{2}+19 y+45=0$
A. If $X>Y$
B. If $X<Y$
C. If $X \geq Y$
D. If $X \leq Y$
E. If $X=Y$ or relation cannot be established

## Answer: A

## Explanation:

$2 X^{2}+5 x+2=0$
$2 X^{2}+4 \mathrm{x}+\mathrm{x}+2=0$
Gives $x=-1 / 2,-2$
$2 Y^{2}+19 y+45=0$
$2 Y^{2}+10 y+9 y+45=0$
Gives $y=-10 / 2,-9 / 2$
Put on number line
$\begin{array}{llll}-10 / 2 & -9 / 2 & -2 & -1 / 2\end{array}$
46. $X^{2}-1=0, Y^{2}+4 y+3=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: C.
Explanation:
$X^{2}=1$
$x= \pm 1$
$Y^{2}+4 \mathrm{y}+3=0$
$Y^{2}+y+3 y+3=0$
$y=-1,-3$
Put on number line
-3-1-1 1
47. $X^{2}-10 x+24=0, Y^{2}-14 y+48=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: D.
Explanation:
$X^{2}-10 x+24=0$
$X^{2}-6 \mathrm{x}-4 \mathrm{x}+24=0$
$x=4,6$
$Y^{2}-14 y+48=0$
$Y^{2}-6 y-8 y+48=0$
$y=6,8$
Put on number line
4668
48. $2 X^{2}-13 x+20=0,2 Y^{2}-7 y+6=0$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: A.
Explanation:
$2 X^{2}-13 x+20=0$
$2 X^{2}-8 x-5 x+20=0$
$x=2.5,4$
$2 Y^{2}-7 y+6=0$
$2 Y^{2}-3 y-4 y+6=0$
$y=1.5,2$
Put on number line
1.522 .54
49. $(15 / \sqrt{x})+(9 / \sqrt{x})=11 \sqrt{x},(\sqrt{ } / / 4)+(5 \sqrt{ } y / 12)=(1 / \sqrt{ })$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $\mathrm{X}=\mathrm{Y}$ or relation cannot be established

Answer: A.
Explanation:
$(15 / \sqrt{x})+(9 / v x)=11 v x$
$24 / v x=11 v x$
$x=24 / 11=2.18$
$(\sqrt{ } y / 4)+(5 v y / 12)=(1 / \sqrt{ } y)$
$(8 \sqrt{ } y / 12)=(1 / \sqrt{ } y)$
$y=1.5$
50. $X^{4}-227=398, Y^{2}+321=346$
A. $X>Y$
B. $X<Y$
C. $X \geq Y$
D. $X \leq Y$
E. $X=Y$ or relation cannot be established

Answer: E.

Explanation:
$X^{4}-227=398$
$X^{4}=625$

Take square root on both sides
$X^{2}=25$
$x=5,-5$
$Y^{2}+321=346$
$Y^{2}=25$
$Y^{2}=25$
$y= \pm 5$


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