



MATHS

BOOKS - SELINA MATHS (ENGLISH)

QUADRATIC EQUATIONS

Example

1. Is $(3x - 2)(2x - 3) = (2x + 5)(2x - 1)$ a quadratic equation ?



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2. is $3x(2x - 5) + 6 = 2x(3x + 5) - 6$ a quadratic equation ?



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3. For the quadratic equation

$3x^2 + 5x - 2 = 0$, show that :

(i) $x = \frac{1}{3}$ is a solution.

(ii) $x = 3$ is not a solution.



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4. If $x = 1\frac{1}{2}$ is a solution of the equation $2x^2 + px - 6 = 0$, find the value of 'p'.



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5. If $\frac{2}{3}$ and $-\frac{1}{2}$ are solution of quadratic equation $6x^2 + ax - b = 0$, find the values of a and b.



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6. Without solving, examine the nature of the roots of the equations :

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

(ii) $x^2 + 6x + 9 = 0$

(iii) $2x^2 + 6x + 3 = 0$



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7. Find the values of 'm', if the roots of the following quadratic equation are equal,

$$(4 + m)x^2 + (m + 1)x + 1 = 0.$$

A. $m = 4$ or $m = -3$

B. $m = 5$ or $m = 0$

C. $m = 5$ or $m = -3$

D. None

Answer: C



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8. Solve :

(i) $2x^2 - 7x = 39$

(ii) $x^2 = 5x$

(iii) $x^2 = 16$



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9. Solve : $\frac{x}{x-1} + \frac{x-1}{x} = 2\frac{1}{2}$.



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10. Find the quadratic equation whose solution set is $\{-2, 3\}$.



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11. Use the substitution $x = 3y + 1$ to solve for y , if $5(3y + 1)^2 + 6(3y + 1) - 8 = 0$.



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12. Without solving equation $x^2 - x + 1 = 0$, find whether $x = -1$ is a root of this equation or root.



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13. Find the value of k for which $x = 2$ is a root (solution) of equation $kx^2 + 2x - 3 = 0$.



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14. If $x = 2$ and $x = 3$ are roots of the equation $3x^2 - 2mx + 2n = 0$, find the values of m and n .



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15. Find the value of 'k' for which $x = 3$ is a solution of the quadratic equation,

$$(k + 2)x^2 - kx + 6 = 0$$

Hence, find the other root of the equation.



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16. Solve each of the following equations by using the formula :

(i) $5x^2 - 2x - 3 = 0$

(ii) $x^2 = 18x - 77$





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17. Solve the following equation for x and give your answer correct to 2 decimal places :

$$3x^2 + 5x - 9 = 0$$



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18. Solve the following equation :

$$x - \frac{18}{x} = 6.$$
 Give your answer correct to two

significant figures.



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19. Solve :

$$(i) 2x^2 - 5x + 3 = 0$$

$$(ii) (x^2 + 3x)^2 - (x^2 + 3x) - 6 = 0, x \in R$$



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20.

Solve

:

$$\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 2\frac{1}{6}, x \neq 0 \text{ and } x \neq 1.$$



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21. Find the solution set of the equation

$$3x^2 - 8x - 3 = 0, \text{ when :}$$

(i) $x \in \mathbb{Z}$ (integers)

(ii) $x \in \mathbb{Q}$ (rational numbers).



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22. Solve : $(2x - 3)^2 = 25$.



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23. Solve for x :

$$4\left(x - \frac{1}{x}\right)^2 + 8\left(x + \frac{1}{x}\right) = 29. x \neq 0.$$



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24. Solve : $\frac{a}{ax - 1} + \frac{b}{bx - 1} = a + b$, where
 $a + b \neq 0, ab \neq 0$.



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1. Find which of the following equations are quadratic :

(i) $(3x - 1)^2 = 5(x + 8)$

(ii) $5x^2 - 8x = -3(7 - 2x)$

(iii) $(x - 4)(3x + 1) = (3x - 1)(x + 2)$

(iv) $x^2 + 5x - 5 = (x - 3)^2$

(v) $7x^3 - 2x^2 + 10 = (2x - 5)^2$

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



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2. (i) Is $x = 5$ a solution of the equation

$$x^2 - 2x - 15 = 0?$$

(ii) Is $x = -3$ a solution of the equation

$$2x^2 - 7x + 9 = 0?$$



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3. If $\sqrt{\frac{2}{3}}$ is a solution of equation

$$3x^2 + mx + 2 = 0, \text{ find the value of } m.$$



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4. $\frac{2}{3}$ and 1 are the solutions of equation $mx^2 + nx + 6 = 0$. Find the values of m and n.



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5. If 3 and -3 are the solutions of equation $ax^2 + bx - 9 = 0$, find the values of a and b.



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1. Without solving , comment upon the nature of roots of each of the following equations :

(i) $7x^2 - 9x + 2 = 0$

(ii) $6x^2 - 13x + 4 = 0$

(iii) $25x^2 - 10x + 1 = 0$

(iv) $x^2 + 2\sqrt{3}x - 9 = 0$

(v) $x^2 - ax - b^2 = 0$

(vi) $2x^2 + 8x + 9 = 0$



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2. Find the value of 'p'. If the following quadratic equations have equal roots :

(i) $4x^2 - (p - 2)x + 1 = 0$

(ii) $x^2 + (p - 3)x + p = 0$



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3. The equation $3x^2 - 12x + (n - 5) = 0$ has equal roots. Find the value of n.



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4. Find the value of 'm', if following equation has equal roots :

$$(m - 2)x^2 - (5 + m)x + 16 = 0$$



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5. Find the value of k for which the equation $3x^2 - 6x + k = 0$ has distinct and real root.



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1. Solve equations, number 1 to number 20 ,
given below, using factorisation method :

$$x^2 - 10x - 24 = 0$$



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2. Solve equations, number 1 to number 20 ,
given below, using factorisation method :

$$x^2 - 16 = 0$$



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3. Solve equations, number 1 to number 20 ,
given below, using factorisation method :

$$2x^2 - \frac{1}{2}x = 0$$



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4. Solve equations, using factorisation method
:

$$x(x - 5) = 24$$



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5. Solve equation, using factorisation method :

$$\frac{9}{2}x = 5 + x^2$$



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6. Solve equations, number 1 to number 20,
given below, using factorisation method :

$$\frac{6}{x} = 1 + x$$



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7. Solve equations, number 1 to number 20, given below, using factorisation method :

$$x = \frac{3x + 1}{4x}$$



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8. Solve equations, number 1 to number 20, given below, using factorisation method :

$$x + \frac{1}{x} = 2.5$$



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9. Solve equations, number 1 to number 20, given below, using factorisation method :

$$(2x - 3)^2 = 49$$



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10. Solve equations, number 1 to number 20, given below, using factorisation method :

$$2(x^2 - 6) = 3(x - 4)$$



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11. Solve equations, number 1 to number 20, given below, using factorisation method :

$$(x + 1)(2x + 8) = (x + 7)(x + 3)$$



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12. Solve equations, number 1 to number 20, given below, using factorisation method :

$$x^2 - (a + b)x + ab = 0$$



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13. Solve equations, number 1 to number 20, given below, using factorisation method :

$$(x + 3)^2 - 4(x + 3) - 5 = 0$$



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14. Solve equations, number 1 to number 20, given below, using factorisation method :

$$4(2x - 3)^2 - (2x - 3) - 14 = 0$$



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15. Solve equations, number 1 to number 20, given below, using factorisation method :

$$\frac{3x - 2}{2x - 3} = \frac{3x - 8}{x + 4}$$



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16. Solve equations, given below, using factorisation method :

$$2x^2 - 9x + 10 = 0, \text{ when :}$$

(i) $x \in \mathbb{N}$

(ii) $x \in \mathbb{Q}$.



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17. Solve equations, number 1 to number 20, given below, using factorisation method :

$$\frac{x - 3}{x + 3} + \frac{x + 3}{x - 3} = 2\frac{1}{2}$$



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18. Solve equations, number 1 to number 20, given below, using factorisation method :

$$\frac{4}{x + 2} - \frac{1}{x + 3} = \frac{4}{2x + 1}$$



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19. Solve equations, given below, using factorisation method :

$$\frac{5}{x-2} - \frac{3}{x+6} = \frac{4}{x}$$



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20. Solve equation given below, using factorisation method :

$$\left(1 + \frac{1}{x+1}\right) \left(1 - \frac{1}{x-1}\right) = \frac{7}{8}$$



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21. Find the quadratic equation whose solution set is :

(i) $\{3, 5\}$

(ii) $\{-2, 3\}$



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22. (i) Solve :

$$\frac{x}{3} + \frac{3}{6-x} = \frac{2(6+x)}{15}, (x \neq 6)$$

(ii) Solve the equation $9x^2 + \frac{3x}{4} + 2 = 0$, if possible, for real values of x .



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23. Find the value of x , if $a + 1 = 0$ and $x^2 + ax - 6 = 0$.



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24. Find the value of x , if $a + 7 = 0$,
 $b + 10 = 0$ and $12x^2 = ax - b$.



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25. Use the substitution $y = 2x + 3$ to solve for x , if $4(2x + 3)^2 - (2x + 3) - 14 = 0$.



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26. Without solving the quadratic equation $6x^2 - x - 2 = 0$, find whether $x = \frac{2}{3}$ is a solution of this equation or not.



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27. Determine whether $x = -1$ is a root of the equation $x^2 - 3x + 2 = 0$ or not.



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28. If $x = \frac{2}{3}$ is a solution of the quadratic equation $7x^2 + mx - 3 = 0$, find the value of m .



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29. If $x = -3$ and $x = \frac{2}{3}$ are solution of quadratic equation $mx^2 + 7x + n = 0$, find the values of m and n .



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30. If quadratic equation $x^2 - (m + 1)x + 6 = 0$ has one root as $x = 3$, find the value of m and the other root of the equations.



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31. Given that 2 is a root of the equation $3x^2 - p(x + 1) = 0$ and that the equation $px^2 - qx + 9 = 0$ has equal roots, find the values of p and q.



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32. If $x \neq 0$ and $a \neq 0$, solve :

$$\frac{x}{a} - \frac{a + b}{x} = \frac{b(a + b)}{ax}.$$



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33. Solve :

$$\left(\frac{1200}{x} + 2\right)(x - 10) - 1200 = 60.$$



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34. If -1 and 3 are the roots of

$x^2 + px + q = 0$, find the values of p and q .



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1. Solve each of following equations, using the formula :

(i) $x^2 - 6x = 27$

(ii) $x^2 - 10x + 21 = 0$

(iii) $x^2 + 6x - 10 = 0$

(iv) $x^2 + 2x - 6 = 0$



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2. Solve each of the following equations for x and give, in each case, your answer correct to 2 decimal places :

$$(i) x^2 - 8x + 5 = 0$$

$$(ii) 5x^2 + 10x - 3 = 0$$



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3. Solve each of the following equations for x and give, in each case, your answer correct to 2 decimal places :

$$(i) 2x^2 - 10x + 5 = 0$$

$$(ii) 4x + \frac{6}{x} + 13 = 0$$

$$(iii) x^2 - 5x - 10 = 0$$



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4. Solve each of the following equations for x and giving your answer correct to 3 decimal places :

(i) $3x^2 - 12x - 1 = 0$

(ii) $x^2 - 16x + 6 = 0$

(iii) $2x^2 + 11x + 4 = 0$



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5. Solve :

(i) $x^4 - 2x^2 - 3 = 0$

$$(ii) x^4 - 10x^2 + 9 = 0$$



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6. Solve :

$$(i) (x^2 - x)^2 + 5(x^2 - x) + 4 = 0$$

$$(ii) (x^2 - 3x)^2 - 16(x^2 - 3x) - 36 = 0$$



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7. Solve :

$$(i) \sqrt{\frac{x}{x-3}} + \sqrt{\frac{x-3}{x}} = \frac{5}{2}$$

$$(ii) \left(\frac{2x - 3}{x - 1} \right) - 4 \left(\frac{x - 1}{2x - 3} \right) = 3$$



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8. Solve the equation $2x - \frac{1}{x} = 7$. Write your answer correct to two decimal places.



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9. Solve the following equation and give your answer correct to 3 significant figures :

$$5x^2 - 3x - 4 = 0$$



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10. Solve the x using the quadratic formula.

Write your answer correct to two significant

figures. $(x - 1)^2 - 3x + 4 = 0$.



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11. Solve the given quadratic equation,

$x^2 - 3(x + 3) = 0$, giving your answer

correct to two significant figures.



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Exercise 5 E

1. Solve the following equation:

$$\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0,$$
$$x \neq 3, x \neq -\frac{3}{2}$$



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2. Solve each of the following equations :

$$(2x + 3)^2 = 81$$



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3. Solve each of the following equations :

$$a^2x^2 - b^2 = 0$$



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4. Solve each of the following equations :

$$x^2 - \frac{11}{4}x + \frac{15}{8} = 0$$



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5. Solve the following equation:

$$x + \frac{4}{x} = -4, x \neq 0$$



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6. Solve the following equation :

$$2x^4 - 5x^2 + 3 = 0$$



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7. Solve equation :

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



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8. Solve equation :

$$9\left(x^2 + \frac{1}{x^2}\right) - 9\left(x + \frac{1}{x}\right) - 52 = 0$$



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9. Solve equation :

$$2\left(x^2 + \frac{1}{x^2}\right) - \left(x + \frac{1}{x}\right) = 11$$



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10. Solve each of the following equations :

$$\left(x^2 + \frac{1}{x^2}\right) - 3\left(x - \frac{1}{x}\right) - 2 = 0$$



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11. Solve each of the following equations :

$$(x^2 + 5x + 4)(x^2 + 5x + 6) = 120$$



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12. Solve each of the following equations, giving answer upto two decimal places.

(i) $x^2 - 5x - 10 = 0$

(ii) $3x^2 - x - 7 = 0$



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13. Solve :

$$\left(\frac{x}{x+2}\right)^2 - 7\left(\frac{x}{x+2}\right) + 12 = 0, x \neq -2$$

.



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14. Solve :

(i) $x^2 - 11x - 12 = 0$, when $x \in \mathbb{N}$

(ii) $x^2 - 4x - 12 = 0$, when $x \in \mathbb{I}$

(iii) $2x^2 - 9x + 10 = 0$, when $x \in \mathbb{Q}$.



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15. Solve :

$$(a + b)^2 x^2 - (a + b)x - 6 = 0, a + b \neq 0.$$



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16. Solve : $\frac{1}{p} + \frac{1}{q} + \frac{1}{x} = \frac{1}{x + p + q}$



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17. Solve :

(i) $x(x + 1) + (x + 2)(x + 3) = 42$

(ii) $\frac{1}{x + 1} - \frac{2}{x + 2} = \frac{3}{x + 3} - \frac{4}{x + 4}$



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18. For each equation, given below, find the value of 'm' so that the equation has equal roots. Also, find the solution of each equation :

(i) $(m - 3)x^2 - 4x + 1 = 0$

(ii) $3x^2 + 12x + (m + 7) = 0$

(iii) $x^2 - (m + 2)x + (m + 5) = 0$



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19. Without solving the following quadratic equation, find the value of 'p' for which the

roots are equal.

$$px^2 - 4x + 3 = 0$$



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20. Without solving the following quadratic equation, find the value of 'm' for which the given equation has real and equal roots.

$$x^2 + 2(m - 1)x + (m + 5) = 0$$



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Exercise 5 F

1. Solve : $(x + 5)(x - 5) = 24$



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2. One root of the quadratic equation $8x^2 + mx + 15 = 0$ is $\frac{3}{4}$. Find the value of m .

Also, find the other root of the equation.



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3. Show that one root of the quadratic equation $x^2 + (3 - 2a)x - 6a = 0$ is -3 .

Hence, find its other root.



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4. If $p - 15 = 0$ and $2x^2 + px + 25 = 0$, find the values of x .



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5. Find the solution of the quadratic equation

$$2x^2 - mx - 25n = 0, \quad \text{if } m + 5 = 0 \quad \text{and}$$

$$n - 1 = 0.$$



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6. If m and n are roots of the equation :

$$\frac{1}{x} - \frac{1}{x - 2} = 3, \quad \text{where } x \neq 0 \quad \text{and } x \neq 2,$$

find $m \times n$.



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7. Solve, using formula :

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



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8. Solve the quadratic equation

$$8x^2 - 14x + 3 = 0$$

(i) When $x \in I$ (integers)

(ii) When $x \in Q$ (rational numbers)



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9. Find the value of m for which the equation $(m + 4)x^2 + (m + 1)x + 1 = 0$ has real and equal roots.



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10. Find the values of m for which the equation $3x^2 + mx + 2 = 0$ has equal roots.

Also, find the roots of the given equation.



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11. Find the value of k for which equation

$4x^2 + 8x - k = 0$ has real and equal roots.



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12. Find, using the quadratic formula, the roots of the following quadratic equations, if they exist

(i) $3x^2 - 5x + 2 = 0$

(ii) $x^2 + 4x + 5 = 0$



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13. Solve :

(i) $\frac{1}{18 - x} - \frac{1}{18 + x} = \frac{1}{24}$ and $x > 0$.

(ii) $(x - 10) \left(\frac{1200}{x} + 2 \right) = 1260$ and $x < 0$.



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Multiple Choice Questions

1. Degree of a quadratic equation is:

A. 1

B. 2

C. 0

D. Not defined

Answer: B



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2. For $ax^2 + bx + c = 0$, to be a quadratic equation, which of the following condition is must?

A. $a \neq 0$

B. $b \neq 0$

C. $c \neq 0$

D. None of these

Answer: A



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3. The standard form of a quadratic equation is:

A. $ax^2 + bx + c$

B. $ax^2 + bx + c = 0$

C. Both (a) and (b)

D. None of these

Answer: B



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4. The discriminant (D) of a quadratic equation

$ax^2 + bx + c = 0$ is given by the formula:

A. $D = b - 4ac$

B. $D = b^2 + 4ac$

C. $D = b^2 - 4ac$

D. $D = b + 4ac$

Answer: C



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5. The number of roots of a quadratic equation is:

A. 1

B. 2

C. 3

D. 4

Answer: B



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6. If the discriminant (D) of a quadratic equation is zero, then the roots are:

- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: C



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7. If the discriminant (D) of a quadratic equation is greater than zero, then the roots are:

- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: C



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8. If the discriminant (D) of a quadratic equation is less than zero, then the roots are:

- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: B



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9. The nature of roots of the quadratic equation $2x^2 - 3x + 1 = 0$, is

- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: D



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10. The quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, if the value of k is:

A. -4

B. 0

C. ± 4

D. 4

Answer: A



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11. The nature of roots of the equation

$$5x^2 - 6x + 7 = 0 \text{ is:}$$

- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: A



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12. The equation $x^2 + 2x + 1 = (4 - kx)^2 + 3$ will be quadratic, if the value of k is

A. $k=1$

B. $k \neq 1$

C. Any number

D. Insufficient data

Answer: B



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13. If $x=2$ is a solution of the quadratic equation $kx^2 + 2x - 3 = 0$, then the value of k is:

A. -1

B. -4

C. $\frac{1}{4}$

D. $-\frac{1}{4}$

Answer: C



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14. If one root of a quadratic equation

$6x^2 - x - k = 0$ is $\frac{2}{3}$, then the value of k is

A. 2

B. $\frac{1}{9}$

C. $\frac{8}{3}$

D. 1

Answer: B



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15. If the equation $3x^2 - 6x + k = 0$ has real and distinct roots, then the value of k is

A. $k \leq 3$

B. $k = 3$

C. $k > 3$

D. $k < 3$

Answer: D



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16. Which of the following is a root of the equation $x^2 - 7x + 12 = 0$?

A. 5

B. -1

C. 3

D. -4

Answer: C



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17. One root of the quadratic equation

$$3x^2 - 4x - 4 = 0 \text{ is:}$$

A. $\frac{3}{2}$

B. 2

C. $\frac{2}{3}$

D. 6

Answer: B



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18. If a is a natural number and one of the roots of the equation $3x^2 - 14x + 8 = 0$, then the value of a is:

A. 4

B. $\frac{2}{3}$

C. 8

D. 6

Answer: A



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19. If the roots of the quadratic equation $x^2 + 4x + k = 0$ are real, then the value of k is:

A. $k \geq 4$

B. $k > 4$

C. $k < 4$

D. $k \leq 4$

Answer: D



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20. The value of k , for which the roots of $x^2 + kx - 1 = 0$ are real and unequal is:

A. 0

B. -1

C. 2

D. Any number

Answer: D



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21. The roots of the quadratic equation

$x^2 - 7x + 3 = 0$ are:

A. $-6.54, -0.46$

B. $6.54, 0.46$

C. $6.54, -0.46$

D. $-6.54, 0.46$

Answer: B



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22. The roots of the quadratic equation

$2x^2 - 5x - 4 = 0$ are:

A. 3, 5

B. 4.84, -1.98

C. 7, -2

D. 3.14, -0.64

Answer: D



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23. For the equation $\sqrt{4-x} + \sqrt{x+9} = 5$,

the values of x are

A. 0, - 5

B. 2, 3

C. - 1, 6

D. 4, 7

Answer: A



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24. The roots of the equation

$21x^2 - 8x - 4 = 0$ are.

A. $-\frac{1}{2}, \frac{1}{7}$

B. $\frac{1}{3}, \frac{4}{9}$

C. $\frac{2}{3}, -\frac{2}{7}$

D. $\frac{4}{7}, -\frac{2}{3}$

Answer: A



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25. The solution of the equation $x - \frac{18}{x} = 6$

is

A. 3.225, - 1.125

B. - 2.195, 8.195

C. - 4.173, 2.109

D. 2.235, - 1.145

Answer: A



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26. The value of k for which the equation

$x^2 + 3kx + (k^2 - k + 2) + 0$ has equal

roots, is:

A. $-1, -\frac{2}{3}$

B. $-\frac{2}{3}, 1$

C. $\frac{2}{3}, -1$

D. $1, \frac{2}{3}$

Answer: C



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27. The value (s) of x for which

$(x - 1)^2 - 3x + 4 = 0$, are

A. 1.38, 3.62

B. 1.92, 2.46

C. 3,4

D. 1, $\frac{4}{3}$

Answer: C



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28. If $x=2$ and $x=3$ are the roots of the equation $3x^2 - 2mx + 2n = 0$, then the values of m, n respectively are:

A. $\frac{15}{2}, 9$

B. 15, 7

C. 9, 15

D. 7, 13

Answer: B



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29. If $(x + 1)(2x + 8) = (x + 7)(x + 3)$,

then using factorisation method, the value of

x are:

A. $\sqrt{12}, \sqrt{13}$

B. $-\sqrt{13}, -\sqrt{13}$

C. $\pm\sqrt{13}$

D. $\sqrt{13}, \sqrt{13}$

Answer: C



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30. The two natural numbers which differ by 3 and whose squares have the sum 117, are:

A. 4, 7

B. 6,9

C. 8,11

D. 5,8

Answer: B



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31. The roots of the equation

$5x^2 - 6\sqrt{5}x + 9 = 0$ are:

A. $3\sqrt{5}, 3\sqrt{5}$

B. $\frac{4}{\sqrt{5}}, \frac{2}{\sqrt{5}}$

C. $4\sqrt{5}, 2\sqrt{5}$

D. $\frac{3}{\sqrt{5}}, \frac{3}{\sqrt{5}}$

Answer: D



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32. The roots of the equation $2x^2 + 2x = 3$ are:

A. $-1.8225, 0.8225$

B. $-0.7125, 1.4225$

C. $-1.1115, 1.2225$

D. $-1.6445, 0.6295$

Answer: D



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33. If $\frac{6}{x} - \frac{2}{x-1} = \frac{1}{x-2}$, then the value(s)

of x is/are

A. $\frac{1}{3}, \frac{4}{3}$

B. $2, \frac{1}{3}$

C. $1, 2$

D. $3, \frac{4}{3}$

Answer: D



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34. If length of hypotenuse of a right-angled triangle exceeds the length of one side by 2cm and exceeds twice the length of other side by

1cm, then the length of hypotenuse of the triangle is:

A. 17cm

B. 1cm

C. 15cm

D. 22cm

Answer: A



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35. If $2x$ articles cost Rs $(5x + 54)$ and $(x + 2)$ similar articles cost Rs $(10x - 4)$, then the value of x is:

A. $-\frac{6}{5}$

B. 6

C. 8

D. 10

Answer: B



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36. If the sum of two sides, other than hypotenuse of a right-angled triangle is 17cm and the perimeter is 30cm, then the lengths of two sides are:

A. 7cm, 10cm

B. 4cm, 13cm

C. 5cm, 12cm

D. 6cm, 11cm

Answer: D



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37. If the sum of squares of two consecutive odd natural numbers is 290, then the two numbers are:

A. 11, 13

B. 7, 9

C. 13, 15

D. 9, 11

Answer: C



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38. The roots of the equation

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}, x \neq -4, 7 \text{ are}$$

A. 3, 4

B. 4, 7

C. 3, 5

D. 1, 2

Answer: A



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Fill In The Blanks

1. The roots of $-x^2 + \frac{1}{2}x + \frac{1}{2} = 0$ areand

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2. The positive roots of $\sqrt{3x^2 + 6} = 3$ is.....

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3. The nature of roots of the quadratic equation $x^2 - 3(x + 3) = 0$ is.....



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4. The roots of $\sqrt{3}x^2 + 10x - 8\sqrt{3} = 0$ are.....



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5. If $\frac{x + 3}{x + 2} = \frac{3x - 7}{2x - 3}$, $x \neq -2, \frac{3}{2}$, then

value (s) of x is/are.....



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6. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is.....



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Assertion And Reason Based Questions

1. Assertion: The value of k for which the equation $kx^2 + 1 - 2(k - 1)x + x^2 = 0$ has equal roots are 0, 3.

Reason : If the roots of a quadratic equation are equal, then its discriminant is greater than zero.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect

D. Assertion is incorrect but reason is correct

Answer: C



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2. Assertion: A natural number, when increased by 12, equals 160 times its reciprocal. The number is 20.

Reason: The roots of a quadratic equation

$ax^2 + bx + c = 0$ are given by the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect

D. Assertion is incorrect but reason is correct

Answer: D



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3. Assertion: The equation $(2x - 1)^2 - 4x^2 + 5 = 0$ is a quadratic equation.

Reason: Any equation of the form $ax^2 + bx + c = 0, a \neq 0$ is a quadratic equation.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct explanation of assertion.

C. Assertion is correct but reason is incorrect

D. Assertion is incorrect but reason is correct

Answer: D



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4. Assertion: The roots of the equation $x^2 + 3x + 7 = 0$ are imaginary.

Reason: If discriminant (D) of a quadratic equation is less than zero, then the roots of the quadratic equation are imaginary.

A. Both assertion and reason are correct and reason is the correct explanation of assertion.

B. Both assertion and reason are correct but reason is not the correct

explanation of assertion.

C. Assertion is correct but reason is incorrect

D. Assertion is incorrect but reason is correct

Answer: A



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Competency Based Questions

1. An aeroplane travelled a distance of 400km at an average speed of x km/hr. On the return journey, the speed was increased by 40km/hr.



The expression for times taken for the onward journey is

A. $\frac{400}{x}$

B. $400x$

C. $\frac{x}{400}$

D. $x + 400$

Answer: A



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2. An aeroplane travelled a distance of 400km at an average speed of x km/hr. On the return journey, the speed was increased by 40km/hr.



The expression for time taken for the return journey is

A. $400(x + 40)$

B. $\frac{x + 40}{400}$

C. $\frac{400}{x + 40}$

D. $440 + x$

Answer: C



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3. An aeroplane travelled a distance of 400km at an average speed of x km/hr. On the return journey, the speed was increased by 40km/hr.



If the return journey took 30 minutes less than

the onward journey, then the equation formed

in x is:

A. $x^2 - 40x - 32000 = 0$

B. $x^2 + 40x - 32000 = 0$

C. $x^2 + 40x + 32000 + 0$

D. $x^2 - 40x + 32000 = 0$

Answer: B



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4. An aeroplane travelled a distance of 400km at an average speed of x km/hr. On the return journey, the speed was increased by 40km/hr.



The nature of roots of the equation, formed in part (iii), is

A. real and equal

B. real and unequal

C. imaginary

D. None of these

Answer: B



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5. An aeroplane travelled a distance of 400km at an average speed of x km/hr. On the return journey, the speed was increased by 40km/hr.



The positive value of x is

A. 220

B. 240

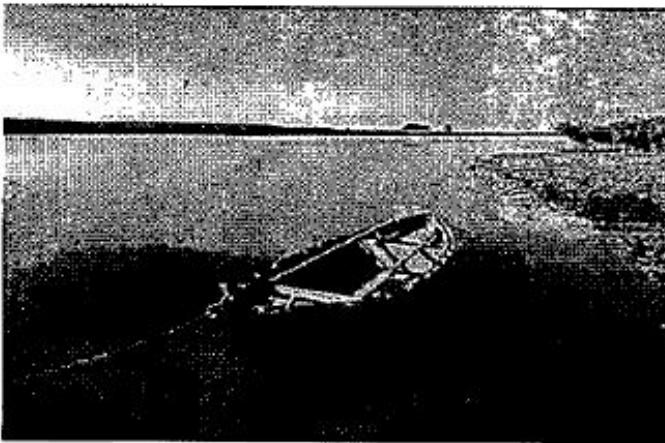
C. 200

D. 160

Answer: D



6. A motor boat cover 10km up the stream and 5km down the stream in 6 hours. If speed of the stream is 1.5km/hr and the speed of motor boat is x km/hr, then answer the following questions



The speed of the boat in up stream is

A. 1.5 km/hr

B. $(x - 1.5)$ km/hr

C. $(x + 1.5)$ km/hr

D. x km/hr

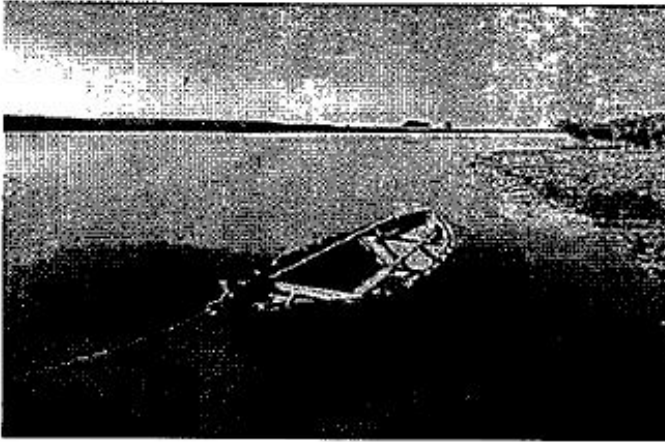
Answer: B



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7. A motor boat cover 10km up the stream and 5km down the stream in 6 hours. If speed of the stream is 1.5km/hr and the speed of motor

boat is x km/hr, then answer the following questions



The equation formed in x is

A. $4x^2 - 2x + 3 = 0$

B. $x^2 - 2x + 3 = 0$

C. $x^2 - 7x - 9 = 0$

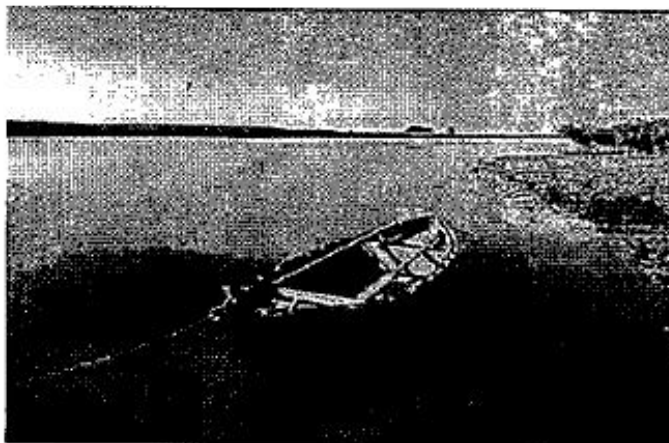
D. $2x^2 - 5x - 7 = 0$

Answer: D



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8. A motor boat cover 10km up the stream and 5km down the stream in 6 hours. If speed of the stream is 1.5km/hr and the speed of motor boat is x km/hr, then answer the following questions



The nature of roots of the equation formed in part (iii) is

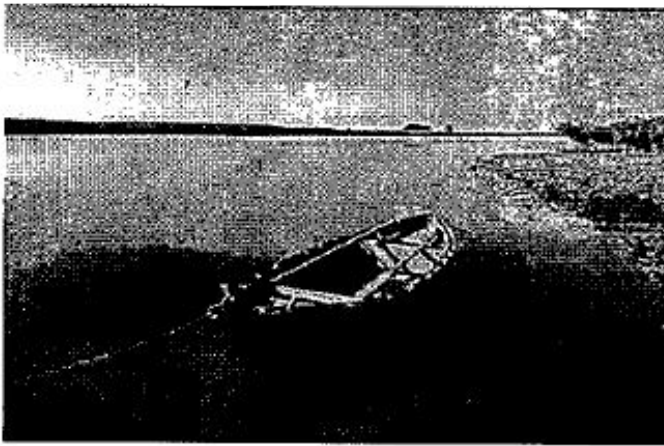
- A. real and equal
- B. real and unequal
- C. imaginary
- D. None of these

Answer: B



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9. A motor boat cover 10km up the stream and 5km down the stream in 6 hours. If speed of the stream is 1.5km/hr and the speed of motor boat is x km/hr, then answer the following questions



The speed of the motor boat is

A. 1km/hr

B. 3.5km/hr

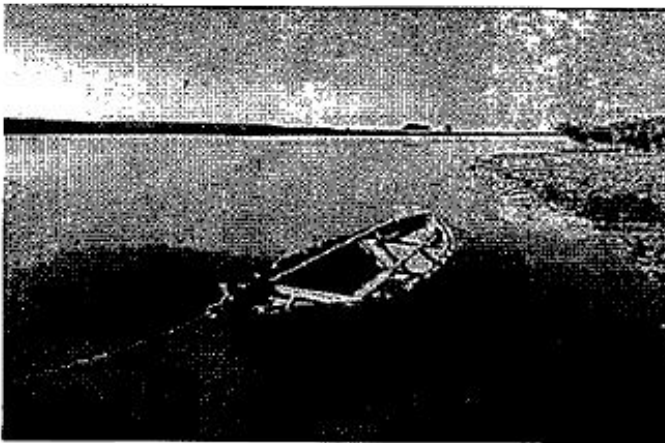
C. 2km/hr

D. 7km/hr

Answer: B



10. A motor boat cover 10km up the stream and 5km down the stream in 6 hours. If speed of the stream is 1.5km/hr and the speed of motor boat is x km/hr, then answer the following questions



How much time boat took in downstream?

A. 1hr

B. 2hr

C. 1.43hr

D. 0.48hr

Answer: A



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