Name   :

Grade   : X

Subject : Math

Worksheet -3

Date :

Submission Date :

Parent's sign :

Real Numbers and Polynomials

1. Find the largest number which divides 2053 and 967 and leaves a remainder of 5 and 7 respectively.

2. Two tankers contain 850 litres and 680 litres of kerosene oil respectively. Find the maximum capacity of a container which can measure the kerosene oil of both the tankers when used an exact number of times.

3. In a morning walk, three persons step off together. Their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that all can cover the same distance in complete steps?

4. Find the least number which when divided by 12, 16, 24 and 36 leaves a remainder 7 in each case.

5. The length, breadth and height of a room are 825 cm, 675 cm and 450 cm respectively. Find the longest tape which can measure the three dimensions of the room exactly.

6. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.

7. Determine the greatest 3-digit number exactly divisible by 8, 10 and 12.

8. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 a.m., at what time will they change simultaneously again?

9. Find the largest number which divides 245 and 1029 leaving remainder 5 in each case.

10. Explain why $3 \times 5 \times 7 + 7$ is a composite number.

11. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

1. Find the sum and product of zeroes of $p(x) = 2(x^2 - 3) + x$.

2. Find a quadratic polynomial, the sum of whose zeroes is 4 and one zero is 5.

3. Find the zeroes of the polynomial $p(x) = \sqrt{2}x^2 - 3x - 2\sqrt{2}$.

4. If α and β are the zeroes of $2x^2 + 5(x - 2)$, then find the product of α and β.

5. Find a quadratic polynomial, the sum and product of whose zeroes are 5 and 3 respectively.

6. If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4, find the value of 'a'.

7. If one zero of the polynomial $(a^2 + 9)x^2 + 13x + 6a$ is reciprocal of the other. Find the value of a.

8. Write a quadratic polynomial, sum of whose zeroes is $2\sqrt{3}$ and their product is 2.

9. Find a polynomial whose zeroes are 2 and –3.

10. Find the zeroes of the quadratic polynomial $x^2 + 5x + 6$ and verify the relationship between the zeroes and the coefficients.

11. If α and β are the zeroes of the quadratic polynomial $f(x) = 6x^2 + x - 2$, then find the value of

$(i) \alpha - \beta$ $(ii) \alpha^2 + \beta^2$ $(iii) \alpha^4 + \beta^4$ $(iv) \alpha\beta^2 + \alpha^2\beta$

$(v) \dfrac{1}{\alpha} + \dfrac{1}{\beta}$ $(vi) \dfrac{1}{\alpha} + \dfrac{1}{\beta} - \alpha\beta$ $(vii) \dfrac{1}{\alpha} - \dfrac{1}{\beta}$ $(viii) \alpha^3 + \beta^3$

$(ix) \dfrac{\alpha}{\beta} + \dfrac{\beta}{\alpha}$

12. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 3$, then find a quadratic polynomial whose zeroes are $\alpha + 2$ and $\beta + 2$

13. If α and β are the zeroes of the quadratic polynomial $f(x) = 3x^2 - 4x + 1$, then find a quadratic polynomial whose zeroes are $\dfrac{\alpha^2}{\beta}$ and $\dfrac{\beta^2}{\alpha}$.

14. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 3$, then find a quadratic polynomial whose zeroes are $\dfrac{\alpha - 1}{\alpha + 1}$ and $\dfrac{\beta - 1}{\beta + 1}$.

15. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - p(x + 1) - c$, show that $(\alpha + 1)(\beta + 1) = 1 - c$.

16. If α and β are the zeroes of the quadratic polynomial such that $\alpha + \beta = 24$ and $\alpha - \beta = 8$, find a quadratic polynomial having α and β as its zeroes.

17. If sum of the squares of zeroes of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k.

18. If α and β are the zeroes of the quadratic polynomial $f(x) = kx^2 + 4x + 4$ such that $\alpha^2 + \beta^2 = 24$, find the value of k.