Mathematics
Holiday Assignment-1
Session 2021-22
Class : IX

1. Explain each of the following in $\frac{p}{q}$ form:

2. (i) 0.675 (ii) 0.3$\overline{2}$ (iii) 0.12$\overline{3}$ (iv) 0.003$\overline{52}$ (v) 4.$\overline{32}$ (vi) 2.317317317.....

3. Find two irrational numbers and two rational numbers between 0.5 and 0.55

4. Simplify each of the following by rationalizing the denominator.

5. (i) $\frac{7 + 3\sqrt{5}}{7 - 3\sqrt{5}}$ (ii) $\frac{2\sqrt{3} - \sqrt{5}}{2\sqrt{2} + 3\sqrt{3}}$ (iii) $\frac{7\sqrt{3} - 5\sqrt{2}}{\sqrt{48} + \sqrt{18}}$

6. Simplify:- a) $3\sqrt{5} + ^{-}\sqrt{5} + \sqrt{180}$ (b) $\sqrt{54} + \sqrt{150}$

7. Give an example each of two irrational numbers, whose

   (i) difference is a rational number   (v) product is a rational number
   (ii) difference is an irrational number   (vi) product is an irrational number
   (iii) sum is a rational number   (vii) quotient is a rational number
   (iv) sum is an irrational number   (viii) quotient is an irrational number

8. Without actual division decide which of following rational numbers have terminating decimal representation:-

   (i) $\frac{33}{375}$ (ii) $\frac{15}{28}$ (iii) $\frac{16}{45}$ (iv) $\frac{12}{35}$ (v) $\frac{80}{27}$ (vi) $\frac{123}{1250}$

9. Examine whether the following numbers are rational or irrational

   (i) $\frac{3\sqrt{8}}{\sqrt{2}}$ (ii) $\left(\sqrt{2} + \frac{1}{\sqrt{2}}\right)^2$ (iii) $\frac{22/7}{5\pi}$ (iv) $(3 + \sqrt{2})(2 - \sqrt{3})(3 - \sqrt{2})(2 + \sqrt{3})$

10. Represent $\frac{8}{5}$ and $\sqrt{20}$ on a number line.

11. (a) Represent $\sqrt{5.2}$ on a number line.   (b) Visualize 0.4$\overline{36}$ on the number line

12. Insert 6 rational numbers between $\frac{n}{-2}$ and $\frac{3}{4}$

13. Find two irrational numbers between $\frac{3}{\sqrt{3}}$ and 2.

14. Rationalise the denominator of $\frac{1}{1 - \sqrt{7}}$

15. Given $\sqrt{3} = 1.732$ app., find to three places of decimal the value of $\frac{1 + 2\sqrt{3}}{2 - \sqrt{3}}$

16. Find the values of 'a' and 'b' if

17. (a) $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$ (b) $\frac{5 + \sqrt{3}}{\sqrt{5} - \sqrt{3}} = \frac{1}{2}a + 3b\sqrt{15}$

18. Simplify:-   (b)
    (a) $\frac{3}{\sqrt{5} - \sqrt{3}}$ $\frac{2\sqrt{7}}{\sqrt{5} + \sqrt{3}}$

19. Evaluate:- a) $(390625|6561)^{1/2}$ (b) $(1296)^{1/4} \times (1296)^{1/2}$