

1. Visualize 3.756 on the number line, using successive magnification

2. Represent $\sqrt{3.5}$ on the number line

3. If $x = 3 + 2\sqrt{2}$, find the value of $x^2 + 1/x^2$

(34)

4. If $x = 2 + \sqrt{5}$, Prove that $x^2 + \frac{1}{x^2} = 18$

5. Express $1.\overline{32} + 0.\overline{35}$ as a fraction in simplest form.

(166/99)

6. Rationalise the denominator

$$\frac{1}{\sqrt{6} + \sqrt{5} - \sqrt{11}}$$

7. If a and b are rational numbers, find a and b

$$a) \frac{\sqrt{2} + \sqrt{3}}{3\sqrt{2} - 2\sqrt{3}} = a + b\sqrt{6}$$

(a=2, b=5/6)

$$b) \frac{\sqrt{5} - 2}{\sqrt{5} + 2} - \frac{\sqrt{5} + 2}{\sqrt{5} - 2} = a + b\sqrt{5}$$

(a = 0, b = - 8)

8. Simplify: a) $\frac{1}{1 + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}}$

(1)

9. If $a = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $b = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, find the value of $a^2 + b^2$

(98)

10. If $a = 9 - 4\sqrt{5}$, find the value of $\left[a - \frac{1}{a}\right]^2$

(320)

11. If $x = 1 - \sqrt{2}$, find the value of $\left[x - \frac{1}{x}\right]^3$

(8)

12. If $x = 3 + 2\sqrt{2}$, find the value of $\left[\sqrt{x} - \frac{1}{\sqrt{x}}\right]$

(8)

13. If $x = 0.125$, find the value of $(1/x)^{1/3}$

14. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ then find the value of x^2

(49 + 20 $\sqrt{6}$)

15. If $x = \frac{1}{2 - \sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$

(3)

16. Find four rational numbers between $3/5$ and $4/5$

17. Find two irrational numbers lying between $\sqrt{2}$ and $\sqrt{3}$

18. Find two rational and irrational numbers between 0.3101 and 0.3222

19. Simplify the following: a) $\left[\frac{576}{625}\right]^{-1/2}$ b) $\left[\frac{343}{1000}\right]^{-1/3}$ c) $(-1/27)^{-2/3}$ d) $(0.008)^{4/3}$ e) $(729)^{-1/6}$

20. Simplify and express the result in the simplest form: $\frac{(25)^{3/2} \times (243)^{2/5}}{(16)^{5/4} \times (8)^{4/3}}$

(1125/512)

21. Find the value x, if $5^{x-3} \times 3^{2x-8} = 225$

(x = 5)

22. Solve: a) $49 \times 7^x = (343)^{1/3}$

(x = -1)

b) $2^x = (128)^{1/7} \times (\sqrt{2})^4$

(3)

c) If $3^x = \frac{9}{27^x}$, find x

(1/2)

d) $(1/7)^{4-2x} = \sqrt{7}$

(9/4)

23. Evaluate: a) $125^{-1/3} \times 27^{1/3} (6^2 + 8^2)^{1/2}$

(6)

b) $(17^2 - 8^2)^{1/2}$

(15)

c) $64^{1/3} (64^{1/3} - 64^{2/3})$

24. Simplify: a) $\sqrt{45} + \sqrt{80} - 3\sqrt{20}$

($\sqrt{5}$)

b) $7\sqrt{6} - \sqrt{252} - \sqrt{294} + 6\sqrt{7}$

(0)

c) $4\sqrt{28} + 3\sqrt{7}$

25. Give an example of two irrational numbers whose: (A) Sum is rational (B) product is rational (C) quotient is rational