

Mathematics

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(Chapter – 1) (Number Systems)(Exemplar Problems)

(Class – IX)

Exercise 1.3

Question 7:

Express the following in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$:

(i) 0.2

(ii) 0.888...

(iii) $5.\bar{2}$

(iv) $0.\overline{001}$

(v) 0.2555...

(vi) $0.1\overline{34}$

(vii) .00323232...

(viii) .404040....

Answer 7:

(i) 0.2

$$\text{Now, } 0.2 = \frac{2}{10} = \frac{1}{5}$$

(ii) 0.888...

Let $x = 0.888 \dots$

$$\Rightarrow x = 0.\bar{8} \dots\dots\dots (1)$$



Multiplying both sides by 10, we get

$$10x = 8.\bar{8} \dots\dots\dots (2)$$

Subtracting equation (1) from equation (2), we get

$$10x - x = 8.\bar{8} - 0.\bar{8}$$

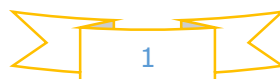
$$\Rightarrow 9x = 8.0$$

$$\Rightarrow x = \frac{8}{9}$$

(iii) $5.\bar{2}$

$$\text{Let } x = 5.\bar{2} \dots\dots\dots (1)$$

Multiplying both sides by 10, we get



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$$10x = 52.\overline{2} \dots\dots\dots (2)$$

Subtracting equation (1) from equation (2), we get

$$10x - x = 52.\overline{2} - 5.\overline{2}$$

$$\Rightarrow 9x = 47$$

$$\Rightarrow x = \frac{47}{9}$$

(iv) $0.\overline{001}$

$$\text{Let } x = 0.\overline{001} \dots\dots\dots (1)$$

Multiplying both sides by 1000, we get

$$1000x = 1.\overline{001} \dots\dots\dots (2)$$

Subtracting equation (1) from equation (2), we get

$$1000x - x = 1.\overline{001} - 0.\overline{001}$$

$$\Rightarrow 999x = 1$$

$$\Rightarrow x = \frac{1}{999}$$



(v) 0.2555...

$$\text{Let } x = 0.2555 \dots$$

$$\Rightarrow x = 0.2\overline{5} \dots\dots\dots (1)$$

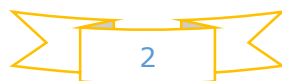
Multiplying both sides by 10 to equation (1), we get

$$10x = 2.\overline{5} \dots\dots\dots (2)$$

Multiplying both sides by 100 to equation (1), we get

$$100x = 25.\overline{5} \dots\dots\dots (3)$$

Subtracting equation (2) from equation (3), we get



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$$100x - 10x = 25.\overline{5} - 2.\overline{5}$$

$$\Rightarrow 90x = 23$$

$$\Rightarrow x = \frac{23}{90}$$

(vi) $0.1\overline{34}$

$$\text{Let } x = 0.1\overline{34} \dots\dots\dots (1)$$

Multiplying both sides by 10 to equation (1), we get

$$10x = 1.\overline{34} \dots\dots\dots (2)$$

Multiplying both sides by 1000 to equation (1), we get

$$1000x = 134.\overline{34} \dots\dots\dots (3)$$

Subtracting equation (2) from equation (3), we get

$$1000x - 10x = 134.\overline{34} - 1.\overline{34}$$

$$\Rightarrow 990x = 133$$

$$\Rightarrow x = \frac{133}{990}$$



(vii) $.00323232\dots$

$$\text{Let } x = 0.00323232 \dots$$

$$\Rightarrow x = 0.00\overline{32} \dots\dots\dots (1)$$

Multiplying both sides by 100 to equation (1), we get

$$100x = 0.\overline{32} \dots\dots\dots (2)$$

Multiplying both sides by 10000 to equation (1), we get

$$10000x = 32.\overline{32} \dots\dots\dots (3)$$

Subtracting equation (2) from equation (3), we get



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$$10000x - 100x = 32.\overline{32} - 0.\overline{32}$$

$$\Rightarrow 9900x = 32$$

$$\Rightarrow x = \frac{32}{9900} = \frac{8}{2475}$$

(viii) .404040....

Let $x = 0.404040 \dots$

$$\Rightarrow x = 0.\overline{40} \dots\dots\dots (1)$$

Multiplying both sides by 100 to equation (1), we get

$$100x = 40.\overline{40} \dots\dots\dots (2)$$

Subtracting equation (1) from equation (2), we get

$$100x - x = 40.\overline{40} - 0.\overline{40}$$

$$\Rightarrow 99x = 40 \Rightarrow x = \frac{40}{99}$$

