Real Number Formative assessment

Question 1. Without actually performing division, state which of these number will terminating decimal expression or non terminating repeating decimal expression

a) 7/25

b) 3/7

c) 29/343

d) 6/15

e) 77/210

f) 11/67

g) 15/27

h) 11/6

i) 343445/140

Solution

Those rational number which can be expressed in form $x/2^m X5^n$ are terminating expression and those can not be are non terminating decimal expression

Terminating decimal: (a), (d)

Non terminating repeating decimal: (b), (c), (e), (f), (g).(h) ,(i)

Question 2. Using Euclid's theorem to find the HCF between the following numbers

a) 867 and 225

b) 616 and 32

Solution

a)

Using Euclid theorem

867=225X3 +192

225=192X1 +33

192=33X5+ 27

33=27X1+6

27=6X4+3

6=3X2+0

So solution is 3

b) 8

Question 3. Write 10 rational number between

a) 4 and 5

b) 1/2 and 1/3

Question 4. Represent in rational form.
a) 1.232323….
b) 1.25
c) 3.67777777

Question 5
a) Prove that $2+\sqrt{3}$ is a irrational number

b) Prove that $3\sqrt{3}$ is a irrational number

Solution

a) Let's take this as rational number
$\frac{a}{b} = 2 + \sqrt{3}$
Or
$\frac{a-2b}{b} = \sqrt{3}$
Since a rational number can't be equal to irrational number, our assumption is wrong

b) Let's take this as rational number
$q = 3\sqrt{3}$
$\frac{q}{3} = \sqrt{3}$

Since a rational number can't be equal to irrational number, our assumption is wrong

Question 6 -True or False statement
a) Number of the form 2n +1 where n is any positive integer are always odd number
b) Product of two prime number is always equal to their LCM
c) $\sqrt{3}X\sqrt{12}$ is a irrational number
d) Every integer is a rational number
e) The HCF of two prime number is always 1
f) There are infinite integers between two integers
g) There are finite rational number between 2 and 3
h) $\sqrt{3}$ Can be expressed in the form $\frac{\sqrt{3}}{1}$,so it is a rational number
i) The number 6^n for n in natural number can end in digit zero
j) Any positive odd integer is of the form 6m+1 or 6m+3 or 6m +5 where q is some integer

Solution

a) True
b) True
c) False, as it is written as 6
d) True ,as any integer can be expressed in the form p/q
e) True
f) False,There are finite integer between two integers
g) False
h) False
i) False
j) True

Multiple choice Questions

Question 7 the HCF (a, b) =2 and LCM (a, b) =27. What is the value a X b
a) 25
b) 9
c) 27
d) 54

Solution (d)

LCM X HCF=aXb

Question 8. $\sqrt{2}+2$ Is a
a) Non terminating repeating
b) Terminating
c) Non terminating non repeating
d) None of these

Solution (c)

Question 9 if a and b are co primes which of these is true

a) LCM (a, b) =aXb
b)HCF (a, b)= aXb
c) a=br
d) None of these

Solution a and b

Question 10. A rational number can be expressed as terminating decimal when the factors of the denominator are

a) 2 or 5 only
b) 2 or 3 only
c)3 or 5 only
d) 3 or 7 only

Solution (a)

Question 11. if $x^2=3$,$y^2=9$, $z^3=27$, which of these is true
a) x is a irrational number
b) y is a rational number
c) z is rational number
d) All of the above

Solution (d)

Short answer question

Question 12 Find the HCF and LCM of these by factorization technique
a) 27,81
b) 120 ,144
c) 29029 ,580

Solution (a)
27= 3X3X3
81=3X3X3X3

HCF=27
LCM=81

b)
120=2X2X3X2X5
144=2X2X3X2x2X3
HCF=2^3X3=24
LCM=720

c)
29029=29X13X11X7
580=29X5X4

HCF=29
LCM=29X13X11x7X4X5=580580

Question 13. Find all the positive integral values of p for which p^2 +16 is a perfect square?

Solution
$p^2+16=q^2$
(q-p)(q+p)=16

So we have
Case 1
q-p=8 and q+p=2 which gives p=3
Case 2
q-p=4 and q+p=4 which gives p=0
Case 3
q-p=2 and q+p=8 which gives p=3

So the answer is 3 only