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Home Work

Mathematics

Submitted by:

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Identify prime Numbers.

a) $\sqrt{3}$ and $\sqrt{120}$

Solution:

$\sqrt{3}$ & $\sqrt{120}$

By taking $\sqrt{3}$

As we know that $\sqrt{3}$ is imperfect square root value. So, we will use the formula

$$= \frac{x + y}{2\sqrt{y}}$$

x is the given imperfect square root value.

y is the nearest perfect square root value to the given number.

So, y would be equal to 4

$$= \frac{3 + 4}{2\sqrt{4}}$$

$$= \frac{7}{2(2)} = \frac{7}{4} = 1.6$$

$$4\overline{)7}\ 1.6$$

4

30

24

6

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By taking $\sqrt{120}$

$$\frac{x + y}{2\sqrt{y}}$$

= As 121 is the nearest value to 120 and perfect square of 11

So, by putting value into the formula

$$= \frac{120 + 121}{2(\sqrt{121})}$$

$$= \frac{241}{2(11)}$$

$$= \frac{241}{22}$$

$$= 10.9$$

$$\begin{array}{r} 10.9 \\ 22\overline{)241} \\ 220 \\ \hline 210 \\ 198 \\ \hline 12 \end{array}$$

The values of $\sqrt{3}$ and $\sqrt{120}$ are 1.6 and 10.9 respectively. Hence, there are 4 prime numbers between them:

2, 3, 5, 7

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b) $\sqrt[2]{10}$ and $\sqrt[2]{410}$

Taking part $\sqrt[2]{10}$

Using Formula

$$\frac{x + y}{2\sqrt{y}}$$

By putting values in formula.

$$= \frac{10 + 9}{2\sqrt{9}}$$

$$= \frac{19}{2(3)}$$

$$= \frac{19}{6}$$

$$\boxed{= 3.16}$$

$$6\overline{)19}\ (3.16$$

18

10

6

40

36

4

Taking part $\sqrt[2]{410}$

Using formula

$$\frac{x + y}{2(\sqrt{y})}$$

By putting values in formula.

$$= \frac{410 + 400}{2\sqrt{400}}$$

$$= \frac{810}{2(20)} = \frac{810}{40}$$

$$4\overline{)81}\ (20.25$$

80

10

8

20

20

0

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$\sqrt[2]{410} = 20.3$

The values of imperfect squares of $\sqrt[2]{10}$ and $\sqrt[2]{410}$ are 3.16 and 20.3 respectively

So, there would be 6 prime numbers between them.

[5, 7, 11, 13, 17, 19]

c) $\sqrt[3]{10}$ and $\sqrt[3]{999}$

Solution:

$\sqrt[3]{10}$ and $\sqrt[3]{999}$

By taking $\sqrt[3]{10}$

Using formula of imperfect ~~square~~ cube root

$$\sqrt[3]{y} + \frac{x - y}{3(\sqrt[3]{y})^2}$$

By putting values into the formula.

$$= \sqrt[3]{8} + \frac{10 - 8}{3(\sqrt[3]{8})^2}$$

$$= \sqrt[3]{2^3} + \frac{10 - 8}{3(\sqrt[3]{2^3})^2}$$

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$$= 2 + \frac{2}{3(2)^2}$$

$$= 2 + \frac{2}{3(4)}$$

$$= 2 + \frac{2}{12}$$

$$= \frac{24+2}{12}$$

$$= \frac{26}{12}$$

$$\boxed{= 2.16}$$

$$12\overline{)26}\ (2.16$$
$$24$$
$$20$$
$$12$$
$$80$$
$$72$$
$$8$$

By solving $\sqrt[3]{999}$

$$= \sqrt[3]{y} + \frac{x-y}{3(\sqrt[3]{y})^2}$$

$$= \sqrt[3]{1000} + \frac{999-1000}{3(\sqrt[3]{1000})^2}$$

$$= \sqrt[3]{10^3} + \frac{(-1)}{3(\sqrt[3]{10})^2}$$

$$= \frac{10-1}{3(10)^2}$$

$$= 10 - \frac{1}{300}$$

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$= \frac{3000 - 1}{300}$

$= \frac{2999}{300}$

$= 9.99$

$300 \overline{)2999}\ 9.99$

2700

2990

2700

2900

2700

200

As the values of $\sqrt[3]{10}$ and $\sqrt[3]{999}$ are 2.16 and 9.99.

Hence the prime numbers between them are 3

3, 5, 7

d) $\sqrt[3]{28}$ and $\sqrt{120}$

Solution :-

By thing $\sqrt[3]{28}$

Using the formula of imperfect cube root.

$$\sqrt[3]{y} + \frac{x - y}{3(\sqrt[3]{y})^2}$$

$$\sqrt[3]{27} + \frac{28 - 27}{3(\sqrt[3]{27})^2}$$

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$= 3 + \frac{1}{3(3)^2}$

$= 3 + \frac{1}{3(9)}$

$= 3 + \frac{1}{27}$

$= \frac{81+1}{27}$

$= \frac{82}{27}$

$= 3.03$

3.03
27|82
81
100
81
19

27
3
81
27
198

By taking part $\sqrt{120}$

$= \frac{x+y}{2\sqrt{y}}$

$= \frac{120+121}{2\sqrt{121}}$

$= \frac{241}{22} = 10.9$

10.9
22|241
220
210
198
12

22
10
00
22X
220
22
11
22
22X
242
220
9
198

The values of $\sqrt[3]{28}$ and $\sqrt{120}$ are 3.03 and 10.9 respectively.

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Hence there are two prime numbers between them:

[5, 7]

e) $\sqrt[2]{8}$ and $\sqrt{400}$

Solution:

By taking $\sqrt[2]{8}$

By using formula of imperfect square root

$$= \frac{x + y}{2\sqrt{y}}$$

$$= \frac{8 + 9}{2\sqrt{9}}$$

$$= \frac{17}{2(3)}$$

$$= \frac{17}{6}$$

$$= 2.83$$

$$\begin{array}{r} 2.83 \\ 6\overline{)17} \\ 12 \\ \hline 50 \\ 48 \\ \hline 20 \\ 18 \\ \hline 2 \end{array}$$

By taking $\sqrt{400}$

~~using~~ As 400 is the perfect square of 20,

So, $\sqrt{400} = 20$

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Hence, the prime numbers between $\sqrt[3]{8}$ and $\sqrt{400}$ would be

[3, 5, 7, 11, 13, 17, and 19]

Question : 2
Find the Missing Numbers.

a. 121, 11, 81, 9 **49** 7

b. 100, 50, 25 **12.50** 6.25

c. 4, 9, 64, 125, 1296 **2391**

d. 2, 5, 12, 24, 48 ____

e. 44, 22, 66, 33, 132 ____

Question : 3
Complete the sum.

a) $9+8-5 = 2 \times (\_\_)$

Solution:

$9+8-5 = 2 \times (\_\_)$

$12 = 2 \times \_\_$

$\frac{12}{2} = x$

$\boxed{x = 6}$

$9+8-5 = 2 \times 6 \Rightarrow \boxed{12 = 12}$

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b) $3 \times 9 - 14 = 24 - (\_)$

Solution:

$3 \times 9 - 14 = 24 - (\_)$

$27 - 14 = 24 - (\_)$

$13 = 24 - x$

$x = 24 - 13$

$\boxed{x = 11}$

$3 \times 9 - 14 = 24 - 11$

$\boxed{13 = 13}$

c) $15 \div 3 \times 12 = 41 + (\_)$

Solution:

$15 \div 3 \times 12 = 41 + x$

$5 \times 12 = 41 + x$

$60 = 41 + x$

$60 - 41 = x$

$19 = x$

$\Rightarrow \boxed{x = 19}$

$15 \div 3 \times 12 = 41 + 19$

$\boxed{60 = 60}$

d) $24 \div 4 + 5 = 66 \div (\_)$

Solution:

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$24 \div 4 + 5 = 66 \div x$

$6 + 5 = 66 \div x$

$11 = \frac{66}{x}$

$x(11) = 66$

$x = \frac{66}{11}\ 6$

$\boxed{x = 6}$

$\Rightarrow 24 \div 4 + 5 = 66 \div 6$

$\boxed{11 = 11}$

e. $8 \times 6 - 13 + 3 = 7 \times 6 - (\_\_)$

Solution:

$8 \times 6 - 13 + 3 = 7 \times 6 - (\_\_)$

$48 - 13 + 3 = 42 - (x)$

$51 - 13 = 42 - x$

$38 = 42 - x$

$x = 42 - 38$

$\boxed{x = 4}$

$8 \times 6 - 13 + 3 = 7 \times 6 - 4$

$\boxed{38 = 38}$