SQUARES AND SQUARE ROOT WORKSHEET FOR CLASS 8

ANSWERS:

1. Perfect square numbers between 60 and 70 = 64

2. (i) 5^2= Sum of first 5 odd numbers = 1 + 3 + 5 + 7 + 9
(ii) 8^2 = Sum of first 8 odd numbers = 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15

3. (i) $11 \times 13 = (12 - 1)(12 + 1) = 12^2 - 1 = 144 - 1 = 143$
(ii) $25 \times 27 = (26 - 1)(26 + 1) = 26^2 - 1 = 676 - 1 = 675$

4. (i) $34^2 - 33^2 = 34 + 33 = 67$
(ii) $89^2 - 88^2 = 89 + 88 = 177$

5. Only9^2, 141^2 and 21^2end with digit 1.

6. (i) $13^2 = 169 = 84 + 85$
$\left(84 = \frac{13^2 - 1}{2} \text{ and } 85 = \frac{13^2 + 1}{2}\right)$
(ii) $17^2 = 289 = 144 + 145$
$\left(144 = \frac{17^2 - 1}{2} \text{ and } 145 = \frac{17^2 + 1}{2}\right)$

7. (i) $\left\{\frac{-2}{9}\right\}^2 = \left\{\frac{-2}{9}\right\}\left\{\frac{-2}{9}\right\} = \frac{4}{81}$
(ii) $\left\{\frac{-5}{7}\right\}^2 = \left\{\frac{-5}{7}\right\}\left\{\frac{-5}{7}\right\} = \frac{25}{49}$

8. 2m, $m^2 - 1$ and $m^2 + 1$ represent the Pythagorean triple Let $2m = 4 \Rightarrow m = 2$
$m^2 - 1 = 2^2 - 1 = 4 - 1 = 3$ and $m^2 + 1 = 2^2 + 1 = 4 + 1 = 5$ Hence (4,6, 8) is a not a Pythagorean triplet.

9. (i) $14^2 - 13^2 = 14 + 13 = 27$
(ii) $29^2 - 28^2 = 29 + 28 = 57$

10. (i) $37 = 2 \times 18 + 1 = 19^2 - 18^2 = 37$
(ii) $81 = 2 \times 40 + 1 = 41^2 - 40^2 = 81$
(iii) $121 = 2 \times 60 + 1 = 61^2 - 60^2 = 121$

11. $192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$ We observe that 2 are grouped in pairs and 3 is left unpaired. If we multiply 192 by the factor 3 then, $192 \times 3 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$.
$576 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$, which is a perfect square.
Therefore, the required smallest number is 3.

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ANSWERS:

1. (i) $225 = 5 \times 5 \times 3 \times 3$ Here, there is no number left to make a pair. 225 is a perfect square.
(ii) $992 = 2 \times 2 \times 2 \times 2 \times 2 \times 31$ Here, 31 is not in pair. 992 is not a perfect square.

2. (i) (14, 48, 50) We know that $2m$, $m^2 - 1$ and $m^2 + 1$ make Pythagorean triplets. Put $2m = 14 \Rightarrow m = 7$, $m^2 - 1 = (7)^2 - 1 = 49 - 1 = 48$, $m^2 + 1 = (7)^2 + 1 = 49 + 1 = 50$ Hence (14, 48, 50) is a Pythagorean triplet.
(ii) (22. 43, 57) Put $2m = 22 \Rightarrow m = 11$, $m^2 - 1 = (11)^2 - 1 = 121 - 1 = 120$, $m^2 + 1 = (11)^2 + 1 = 121 + 1 = 122$ Hence (22, 43, 57) is not a Pythagorean triplet.

3. (i) $121 - 1 = 120$, $120 - 3 = 117$, $117 - 5 = 112$, $112 - 7 = 105$, $105 - 9 = 96$, $96 - 11 = 85$, $85 - 13 = 72$, $72 - 15 = 57$, $57 - 17 = 40$, $40 - 19 = 21$, $21 - 21 = 0$ We have subtracted odd numbers 11 times to get 0. $\sqrt{121} = 11$
(ii) 36 we have subracted odd numbers 6 times to get 0 $\sqrt{36} = 6$
(iii) 196 we have subracted odd numbers 14 times to get 0 $\sqrt{196} = 14$

4. LCM of 2, 4, 8 is the least number divisible by each of them. LCM of 2, 4 and 8 = 8,
$8 = 2 \times 2 \times 2$ To make it perfect square multiply 8 by the product of unpaired numbers, i.e., 2
Required number $= 8 \times 2 = 16$

5. (i) $\sqrt{1036.84} = 32.2$
(ii) $\sqrt{10080.16} = 100.4$

6. We know that $\sqrt{(ab)} = \sqrt{a} \times \sqrt{b}$ $\sqrt{400} = \sqrt{(4 \times 100)} = \sqrt{4} \times \sqrt{100} = 2 \times 10 = 20$
$\sqrt{0.04} = \sqrt{(0.2 \times 0.2)} = 0.2$, $\sqrt{0.000004} = \sqrt{(0.002 \times 0.002)} = 0.002$
$\sqrt{400} + \sqrt{0.04} + \sqrt{0.000004} = 20 + 0.2 + 0.002 = 20.202$

7. (i) $196 = \underline{2 \times 2} \times \underline{7 \times 7} \Rightarrow \sqrt{196} = 2 \times 7 = 14$
(ii) $1024 = \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \times \underline{2 \times 2} \Rightarrow \sqrt{1024} = 2 \times 2 \times 2 \times 2 \times 2 = 32$
(iii) $2916 = \underline{3 \times 3} \times \underline{2 \times 2} \times \underline{9 \times 9} \Rightarrow \sqrt{2916} = 3 \times 2 \times 9 = 54$
(iv) $1764 = \underline{3 \times 3} \times \underline{2 \times 2} \times \underline{7 \times 7} \Rightarrow \sqrt{1764} = 3 \times 2 \times 7 = 42$

8. First, we find the square root of 4229 by division method. Here, we get a remainder 4.
Required perfect square number $= 4229 - 4 = 4225$ and $\sqrt{4225} = 65$

9. The squares of all natural between 70 and 80 are as follows:
$71^2 = 5041$, $72^2 = 5184$, $73^2 = 5329$
$74^2 = 5476$ $75^2 = 5625$ $76^2 = 5776$
$77^2 = 5929$ $78^2 = 6084$ $79^2 = 6241$

10. a) 9.1 b) 8.3 c) 2.8 d) 0.5

SQUARES AND SQUARE ROOT WORKSHEET FOR CLASS 8

ANSWERS

1. The amount paid by each student = The total number of students in the school.

   $1225 = 5 \times 5 \times 7 \times 7$ Therefore

   The amount paid by each student = (the total number of students in the school)

   $= 35$

2. 100,10000 is a perfect square because the number of zeros in the end is even. 230330 and 21543200000 are not perfect squares because the number of zeros in the end is odd.

3. $3844 = 2 \times 2 \times 31 \times 31$ $\sqrt{3844} = \sqrt{2 \times 2 \times 31 \times 31} = 2 \times 31 = 62$

   62 rows are there in auditorium.

4. We know that the three natural numbers m, n, p are said to be Pythagorean triplets if $m^2 + n^2 = p^2$.

   (i) $2^2 + 3^2 = 4 + 9 = 13$ not equal to 16.

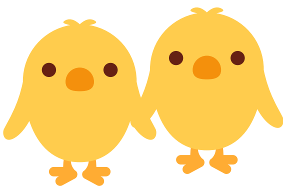
   (ii) $5^2 + 4^2 = 25 + 16 = 41$ not equal to 49

   (iii) $3^2 + 4^2 = 9 + 16 = 25$ equal to $5^2 = 25$

   Therefore(3, 4, 5) are Pythagorean triplets

5. (i) $9408 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 7 \times 7$ Here, 2 and 7 occur in pairs. But 3 doesn't have a pair. Therefore 3 is the smallest number by which 9408 must be divided. so it becomes a perfect square. perfect square = 9408/3 =3136

   Square root = 56



6. a = 4

7. The length of the diagonal is $= \sqrt{15^2 + 20^2}$

   $= \sqrt{625} = 25$ m

8.

10	44100
10	4410
21	441
	21

Square root of 44100 = $10 \times 10 \times 21 \times 21 = 10 \times 21 = 210$

9. If $\sqrt{n} = 15$, $n = 15 \times 15 = 225$

   $3n + 5 = 3(225) + 5 = 680$

10. $\frac{576}{3025} = \frac{24}{55}$

11. 48

12. 7

13. breaking it into parts $(102)^2 = (100 + 2)^2$

    using the identity $(a+b)^2 = a^2 + b^2 + 2ab$

    $(100 + 2)^2 = 100^2 + 2^2 + 2 \times 100 \times 2$

    $= 10404$