

Solve these 3 Pg. No. 40

Using the properties of square numbers, answer the following:

1) Which among the following cannot be perfect squares?

a) 8281

It ends with 1. It is a perfect square

Number	Ends with	Perfect square
a) 8281	1	Yes
b) 2023	3	No
c) 5776	6	Yes
d) 9000	3 zeros	No
e) 6748	8	No

2) Write the units digit in the squares of the following numbers.

Number	Units digit
a) 123	9
b) 670	0
c) 856	6
d) 4008	4
e) 1199	1

Exercise 3A.

1. Write all the perfect squares from 150 to 500

169, 196, 225, 256, 289, 324, 361, 400,

441, 484

2. Find the square of the following numbers

a) $15^2 = 15 \times 15 = 225$

f) $\left(\frac{10}{11}\right)^2 = \frac{10 \times 10}{11 \times 11} = \frac{100}{121}$

b) $33^2 = 33 \times 33 = 1089$

g) $\left(\frac{-6}{23}\right)^2 = \frac{-6 \times -6}{23 \times 23} = \frac{36}{529}$

c) $49^2 = 49 \times 49 = 2401$

h) $3\frac{5}{11} = \left(\frac{38}{11}\right)^2 = \frac{38 \times 38}{11 \times 11}$

d) $(-8)^2 = (-8) \times (-8) = 64$

$= \frac{1444}{121}$

e) $(-41)^2 = (-41) \times (-41) = 1681$

i) $\left(\frac{-7}{80}\right)^2 = \frac{-7 \times -7}{80 \times 80} = \frac{49}{6400}$

j) $(0.25)^2 = \left(\frac{25}{100}\right)^2 = \frac{25 \times 25}{100 \times 100} = \frac{625}{10000}$

$= 0.0625$

3. Using prime factorisation, determine which among the following are perfect squares:

a) 784

$$\begin{array}{r} 2 \overline{) 784} \\ 2 \overline{) 392} \\ 2 \overline{) 196} \\ 2 \overline{) 98} \\ 7 \overline{) 49} \\ 7 \end{array}$$

~~$784 = 2 \times 2 \times 2 \times 2 \times 7 \times 7$~~

~~It is not a perfect square~~

$784 = (2 \times 2 \times 2 \times 2) \times (7 \times 7)$

It is perfect square

b) 1009

$$\begin{array}{r} 1 \overline{) 1009} \\ 1009 \end{array}$$

$1009 = 1 \times 1009$

It is not a perfect square

c) 2592

$$\begin{array}{r}
 2 \overline{) 2592} \\
 \underline{2} 96 \\
 2 \overline{) 1296} \\
 \underline{2} 48 \\
 2 \overline{) 648} \\
 \underline{2} 24 \\
 2 \overline{) 324} \\
 \underline{2} 162 \\
 2 \overline{) 162} \\
 \underline{3} 81 \\
 3 \overline{) 81} \\
 \underline{3} 27 \\
 3 \overline{) 27} \\
 \underline{3} 9 \\
 3 \overline{) 9} \\
 \underline{3} 0
 \end{array}$$

$$2592 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3$$

It is not a perfect square,

d) 4356

$$\begin{array}{r}
 2 \overline{) 4356} \\
 \underline{2} 178 \\
 2 \overline{) 2178} \\
 \underline{3} 1089 \\
 3 \overline{) 1089} \\
 \underline{3} 363 \\
 3 \overline{) 363} \\
 \underline{11} 121 \\
 11 \overline{) 121} \\
 \underline{11} 0
 \end{array}$$

$$4356 = 2 \times 2 \times 3 \times 3 \times 11 \times 11$$

It is perfect square

e) 6084

$$\begin{array}{r}
 2 \overline{) 6084} \\
 \underline{2} 042 \\
 2 \overline{) 3042} \\
 \underline{3} 1521 \\
 3 \overline{) 1521} \\
 \underline{3} 507 \\
 3 \overline{) 507} \\
 \underline{13} 169 \\
 13 \overline{) 169} \\
 \underline{13} 0
 \end{array}$$

$$6084 = 2 \times 2 \times 3 \times 3 \times 13 \times 13$$

It is perfect square.

4) Identify whether the squares of the following numbers are even or odd.

Note: Squares of even no. \Rightarrow even
 Squares of odd no. \Rightarrow odd

Number	a) 155	b) 374	c) 593	d) 766	e) 129
Squares are	odd	even	odd	even	odd

5. Without calculation, identify which among the following can be perfect squares.

Numbers	Ends with	Perfect squares
a) 1600	2 zeros	Yes
b) 3738	8	No
c) 8649	9	Yes
d) 5012	2	No
e) 7744	4	Yes

Note:

Squares no's cannot be end with

2, 3, 7, 8.

6. Write the units digit in the squares of the following numbers.

Numbers	Units digit	
a) 598	4	$8^2 = 64$
b) 2617	9	$7^2 = 49$
c) 8309	1	$9^2 = 81$
d) 7524	6	$4^2 = 16$
e) 4865	5	$5^2 = 25$

7. Find the least number by which 1500 is to be multiplied to get a perfect square?

$$\begin{array}{r}
 5 \overline{)1500} \\
 \underline{5 \overline{)300}} \\
 \underline{5 \overline{)60}} \\
 \underline{3 \overline{)12}} \\
 \underline{2 \overline{)4}} \\
 2
 \end{array}$$

$$1500 = (5 \times 5) \times 5 \times 3 \times (2 \times 2)$$

5 and 3 does not have pairs

$$\therefore 1500 \times 5 \times 3 = (5 \times 5) \times (5 \times 5) \times (3 \times 3) \times (2 \times 2)$$

Therefore the least number to be multiplied is $5 \times 3 = 15$

Find the least number by which 6318 is to be divided to get a perfect square.

$$\begin{array}{r}
 2 \overline{)6318} \\
 3 \overline{)3159} \\
 3 \overline{)1053} \\
 3 \overline{)351} \\
 3 \overline{)117} \\
 3 \overline{)39} \\
 13
 \end{array}$$

$$6318 = 2 \times (3 \times 3) \times (3 \times 3) \times 3 \times 13$$

2, 3 and 13 does not have pairs

$$\therefore \frac{6318 \times 2 \times 3 \times 13}{2 \times 3 \times 13} = \frac{(2 \times 2) \times (3 \times 3) \times (3 \times 3) \times (3 \times 3) \times (13 \times 13)}{2 \times 3 \times 13}$$

Therefore the least number to be divided

$$2 \times 3 \times 13 = 6 \times 13 = 78$$

$$\frac{6318}{2 \times 3 \times 13} = \frac{\cancel{2} \times \cancel{3} \times (3 \times 3) \times (3 \times 3) \times 13}{\cancel{2} \times \cancel{3} \times 13}$$

Therefore the least number to be divided is $2 \times 3 \times 13 = 6 \times 13 = 78$.