

Square And Square Roots

Ex. 5.4

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Exc. 5.4

1. $\sqrt{1 + \frac{49}{576}} = 1 + \frac{x}{24}$

or $\sqrt{\frac{576+49}{576}} = 1 + \frac{x}{24}$

or $\sqrt{\frac{625}{576}} = 1 + \frac{x}{24}$

or $\frac{25}{24} = 1 + \frac{x}{24}$

or $\frac{25}{24} - 1 = \frac{x}{24}$

or $\frac{25-24}{24} = \frac{x}{24}$

or $\frac{1}{24} = \frac{x}{24}$

or $1 = x$ (A)

2.a. $\sqrt{\frac{3}{5}} = \sqrt{0.6}$

$= 0.774$

≈ 0.77

	0.774
7	0.600000
+ 7	-49
147	1100
+ 7	-1029
1544	7100
	-6176
	924

b. $\sqrt{\frac{5}{6}}$

$= \sqrt{0.833333}$

$$\begin{array}{r}
 912 \\
 \hline
 9 \quad 0.\underline{833333} \\
 +9 \quad -81 \\
 \hline
 181 \quad 233 \\
 +1 \quad -181 \\
 \hline
 1822 \quad 5233 \\
 \quad -3644 \\
 \hline
 \quad 1589
 \end{array}$$

$$\sqrt{\frac{5}{6}} = 0.912 \approx 0.91$$

$$\begin{aligned}
 \text{c. } & \sqrt{7\frac{3}{16}} \\
 &= \sqrt{\frac{115}{16}} \\
 &= \sqrt{7.1875} \\
 &= 2.680 \\
 &\approx 2.68
 \end{aligned}$$

$$\begin{array}{r}
 680 \\
 \hline
 2 \quad 7.\underline{187500} \\
 +2 \quad -4 \\
 \hline
 46 \quad 318 \\
 +6 \quad -276 \\
 \hline
 528 \quad 4275 \\
 +8 \quad -4224 \\
 \hline
 5360 \quad 5100 \\
 \quad - \quad 0 \\
 \hline
 \quad 5100
 \end{array}$$

$$\begin{aligned}
 \text{d. } & \sqrt{1\frac{7}{11}} \\
 &= \sqrt{\frac{18}{11}} \\
 &= \sqrt{1.636363} \\
 &= 1.279 \\
 &\approx 1.28
 \end{aligned}$$

$$\begin{array}{r}
 279 \\
 \hline
 1 \quad 1.\underline{636363} \\
 +1 \quad -1 \\
 \hline
 22 \quad 63 \\
 +2 \quad -44 \\
 \hline
 247 \quad 1963 \\
 +7 \quad -1729 \\
 \hline
 2549 \quad 23463 \\
 \quad -22941 \\
 \hline
 \quad 522
 \end{array}$$

			<u>2.236</u>
3a.	$\sqrt{5}$	2	5.000000
=	2.236	+2	-4
\approx	2.24	42	100
		+2	-84
		443	1600
		+3	-1329
		4466	27100
			-26796
			304

			<u>1.732</u>
b.	$\sqrt{3}$	1	3.000000
=	1.732	+1	-1
\approx	1.73	27	200
		+7	-189
		343	1100
		+3	-1029
		3462	7100
			-6924
			176

			<u>3.162</u>
c.	$\sqrt{10}$	3	10.000000
=	3.162	+3	-9
\approx	3.16	61	100
		+1	-61
		626	3900
		+6	-3756
		6322	14400
			-12644
			1756

3.605

d.	$\sqrt{13}$		
=	3.605	3	<u>13.00 00 00</u>
≈	3.61	+3	-9
		66	<u>400</u>
		+6	-396
		720	<u>400</u>
		+0	-0
		7205	<u>40000</u>
			-36025
			3975

e.	$\sqrt{0.8}$		
=	0.894	8	<u>0.80 00 00</u>
≈	0.89	+8	-64
		169	<u>1600</u>
		+9	-1521
		1784	<u>7900</u>
			-7136
			764

f.	$\sqrt{4.372}$		
=	2.090	2	<u>4.3720 00</u>
≈	2.09	+2	-4
		40	<u>37</u>
		+0	-0
		409	<u>3720</u>
		+9	-3681
		4180	<u>3900</u>
			-0
			3900

$$\sqrt{24.12}$$

$$= 4.910$$

$$\approx 4.91$$

4.910	
4	24.12 0000
+4	-16
89	812
+9	-801
981	1100
+1	-981
9820	1190
	- 0
	1190

$$\sqrt{0.0187}$$

$$= 0.136$$

$$\approx 0.14$$

0.136	
1	0.0187 00
+1	-1
23	87
+3	-69
266	1800
	-1596
	204

$$\sqrt{3009}$$

$$= 1.7346$$

$$\approx 1.735$$

1.7346	
1	3.0090 00 00
+1	-1
27	200
+7	-189
343	1190
+3	-1029
3464	16100
+4	-13856
34686	224400
	-208116
	16284

$$\begin{array}{r}
 5. \quad \sqrt{15.16} \\
 = \quad 3.893 \\
 \approx \quad 3.89
 \end{array}
 \quad
 \begin{array}{r}
 3 \quad \overline{15.160000} \\
 +3 \quad \underline{-9} \\
 68 \quad 616 \\
 +8 \quad \underline{-544} \\
 769 \quad 7200 \\
 +9 \quad \underline{-6921} \\
 7783 \quad 27900 \\
 \underline{\hspace{1.5cm}} \quad \underline{-23349} \\
 \hspace{1.5cm} 4551
 \end{array}$$

$$\begin{array}{r}
 6. \quad \overline{0.948} \\
 9 \quad \overline{0.9000} \\
 +9 \quad \underline{-81} \\
 184 \quad 900 \\
 +4 \quad \underline{-736} \\
 1888 \quad 16400 \\
 \underline{\hspace{1.5cm}} \quad \underline{-15104} \\
 \hspace{1.5cm} 1296
 \end{array}$$

$$\sqrt{0.9} = 0.948$$

$$\approx 0.95$$

$$\therefore \sqrt{0.9} \neq 0.3$$

7. Length of rectangle, $l = 14 \text{ m}$

Breadth of rectangle, $b = 11 \text{ m}$

Area of rectangle = $l \times b$

$$= 14 \times 11$$

$$= 154 \text{ m}^2$$

Let side of square be 'a' metres

\therefore Area of square = $a^2 \text{ sq. m.}$

Area of square = area of rectangle (given)

or $a^2 = 154$

or $a = \sqrt{154}$

or $a = 12.409$

or $a \approx 12.41$

∴ Side of square $\approx 12.41\text{m}$

	12.409
1	154.000000
+1	-1
22	54
+2	-44
244	1000
+4	-976
2480	2400
+0	-0
24809	240000
	-223281
	16719

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