Exercise 4(A)

1) (i) $7^3 = 7 \times 7 \times 7 = 343$

(ii) $11 = 11 \times 11 \times 11 = 1331$

(iii) $16 = 16 \times 16 \times 16 = 4096$

(iv) $23 = 23 \times 23 \times 23 = 12,167$

(v) $31 = 31 \times 31 \times 31 = 29,791$

2) (iv) 24000

2 | 24000
2 | 12000
2 | 6000
3 | 3000
5 | 1000
5 | 200
5 | 40
2 | 8
2 | 4
2 | 2

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

$(2 \times 2 \times 2)$

$2^3 \times (3) \times 5^3 \times 2^3$

Not a Perfect

ऽ) 1728

:

2 | 1728
2 | 864
2 | 432
2 | 216
2 | 108
2 | 54
3 | 27
3 | 9
3 | 3
1

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

$2^3 \times 2^3 \times 3^3$
(Perfect sq.)

ऽऽ) ~~1938~~

2 | ~~1938~~
3 | 969
3 | ~~323~~
1

3.ऽ) $2.1 = 2.1 \times 2.1 \times 2.1$
$= 9.261$

ऽऽ) $0.4 = 0.4 \times 0.4 \times 0.4$
$= 0.064$

ऽ३) $1.6 = 1.6 \times 1.6 \times 1.6$
$= 4.096$

iv) $25 = 2.5 \times 2.5 \times 2.5$
$= 15.625$

v) $0.12 = 0.12 \times 0.12 \times 0.12$
$= 0.001728$

vi) $0.02 = 0.02 \times 0.02 \times 0.02$
$= 0.000008$

7. $1323 = 3^3 \times 7^2$

1323 must be multiplied with 7.

3 | 1323
3 | 441
3 | 147
7 | 49
7 | 7
1

8. $8763 = 2^3 \times 2^3 \times 137$

8763 must be multiplied 137.

2 | 8763
2 | 4384
2 | 2192
2 | 1096
2 | 548
2 | 274
137 | 137

9.
3 | 27783
3 | 9261
3 | 3087
3 | 1029
7 | 343
7 | 49
7 | 7
1

$27783 = 3^3 \times 3 \times 7^3$
$= 3 \times 3 = 9$

10. i) $\frac{3}{7} = \frac{27}{343}$

ii) $\frac{8}{9} = \frac{512}{729}$

iii) $\frac{10}{13} = \frac{1000}{2197}$

iv) $1\frac{2}{7} = \frac{243}{343}$

v) $-3 = -3x - 3x - 3$
$= -27$

~~vi) $-343 = -343x - 343x - 343$~~

vii) $-7 = -7x - 7x - 7$
$= -343$

viii) $-12 = -12x - 12y - 12$
-1728

ix) $-18 = -18x - 18x - 18$
-15625

6) 216, 8000, 4096

ii) 729, 3375, 125, 343, 9261

10. $8640 = 2^3 \times 2^3 \times 3^3 \times 5$

$= 5$

2	8640
2	4320
2	2160
2	1080
2	540
2	270
3	135
3	45
3	15
5	5
	1

11) 77175.

$= 5^2 \times 3^2 \times 7^3$

$= 5 \times 3 = 15$

5	77175
5	15,435
3	3087
3	1029
7	343
7	49
7	7
	1

f. 1323

3 | 1323
3 | 441
3 | 147
7 | 49
7 | 7
1

= (3×3×3) (7×7)

$= 3^3 \times 7^2 (7) = 7$

8. 8768

2 | 8768
2 | 4384
2 | 2192
2 | 1096
2 | 548
2 | 274
137

(2×2×2) (2×2×2) (137)

= 137

9. 277883

3 | 277883
3 | 92627
3 | 30875
5 | 10291
7 | 2059
7 | 343
7 | 49
7 | 7
1

$= 3^3 \times 3 \times 7^3$

= 3

11/5/21

4(B)

i. $\sqrt[3]{64} = \sqrt[3]{2^3 \times 2^3} = \sqrt[3]{2^3} \times \sqrt[3]{2^3}$

$= 2 \times 2 = 4$

2	64
2	32
2	16
2	8
2	4
2	2
	1

ii. $\sqrt[3]{343} = \sqrt[3]{7^3} = \sqrt[3]{7^3} = 7$

7	343
7	49
7	7
	1

iii. $\sqrt[3]{729} = \sqrt[3]{9^3} = \sqrt[3]{9^3} = 9$

9	729
9	81
9	9
	1

iv) $\sqrt[3]{1728} \cdot \sqrt[3]{12^3} = 12$

12 | 1728
12 | 144
12 | 12
1

v) $\sqrt[3]{9261} = \sqrt{3^3 \times 7^3} = \sqrt[3]{3^3} \times \sqrt[3]{7^3} = 3 \times 7 = 21$

3 | 9261
3 | 3087
3 | 1029
7 | 343
7 | 49
7 | 7
1

2. i) $\sqrt[3]{\frac{125}{216}} = \frac{\sqrt{5 \times 5 \times 5}}{\sqrt{6 \times 6 \times 6}} = \frac{5}{6}$

5 | 125
5 | 25
5 | 5
1

6 | 216
6 | 36
6 | 6
1

iii) $\frac{125}{216} = \frac{343}{512}$

vii) $3375 \times 512 = \sqrt{15 \times 15 \times 15 \times 8 \times 8 \times 8} = 15 \times 8 = 120$

$= 17\ 28000$

15 | 1728000
15 | 115,200
15 | 7680
8 | 512
8 | 64
8 | 8
1

3. i) $\frac{27}{-125} \cdot \sqrt[3]{-8} \cdot -\left(\sqrt[3]{8}\right)$

$= \sqrt[3]{\frac{-27}{125}} = \frac{\sqrt[3]{-27}}{\sqrt[3]{125}} \cdot \frac{\sqrt[3]{(-3)^3}}{} = 3$

viii) $-5832 \sqrt[3]{(-18)^3} = -18$

2 | 5832
2 | 2916
2 | 1458
3 | 729
3 | 243
3 | 81
3 | 27

$2^3 \times 3^3 \times 3^3$
$= 18^3$

iii) $-2744000 = \sqrt[3]{(140^3)} = -140$

5 | 2744000	$= 5^3 \times 4^3 \times 7^3$
5 | 548,800	
5 | 109,760	
4 | 21,952	$= 140^3$
4 | 5488	
4 | 1372	
7 | 343	
7 | 49	
7 | 7	
1	

iv) 2.744

$= \frac{\sqrt[3]{2744}}{1000} = \frac{2 \times 2 \times 2 \times 7 \times 7 \times 7}{10 \times 10 \times 10}$

2 | 2744	$= \frac{2^3 \times 7^3}{10^3}$
2 | 1372	
2 | 686	
7 | 343	$= \frac{2 \times 7}{10} = \frac{14}{10} = 1.4$
7 | 49	
7 | 7	
1	

v) $-15.625 = \sqrt[3]{\frac{15625}{1000}}$

5 | 15625	$= \frac{5^3 \times 5^3}{10^3}$
5 | 3125	
5 | 625	
5 | 125	$= \frac{(-5) \times 5}{10} = \frac{-25}{10} = -25$
5 | 25	
5 | 5	
1	

vi) $0.000027 =$

5. 26244

3 | 26244	$= 3^3 \times 3^3 \times 3^3 \times 2 \times 2$
3 | 8748	
3 | 2916	
3 | 972	$= 324$
3 | 324	
3 | 108	
3 | 36	
3 | 12	
2 | 4	
2 | 2	
1	

6. 30375

3 | 30375
3 | 10125
3 | 3375
3 | 1125
3 | 375
5 | 125
5 | 25
5 | 5
1

$= 3^3 \times (3 \times 3) \times 5^3$

$= 3$

ii) 700 × 2 × 49 × 5

2 | 700 — 2 | 350 — 5 | 175 — 5 | 35 — 7 | 7 — 1

2 | 2 — 1

7 | 49 — 7 | 7 — 1

5 | 5 — 1

$= 2 \times 2 \times 5 \times 5 \times 7 \times 2 \times 7 \times 7 \times 5$

$= 2^2 \times 5^2 \times 7 \times 2 \times 7^2 \times 5$

$= 2^3 \times 5^3 \times 7^3 = \sqrt{2^3 \times 5^3 \times 10^3}$

$= 70$

iii) 216 × 1728

2 | 216
2 | 108
3 | 9
3 | 3
1

2 | 1728
2 | 864
2 | 432
2 | 216
2 | 108
2 | 54
3 | 27
3 | 9
3 | 3
1

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

$(2 \times 2 \times 2 \times 2 \times 2 \times 2)$

$(3 \times 3 \times 3)$

$= 2^3 \times 2^3 \times (2 \times 2) \cdot 3^3 \times (3 \times 3)$

$= \sqrt{2^3 \times 2^3 \times 2 \times 2 \times 3^3 \times 3 \times 3}$

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

$= 72$