POWERS AND ROOTS

1. *Without using a calculator*, find the value of each of these expressions. You must show enough workings to show that you didn’t use a calculator:

a) 3-2 b) 161/2 c) 93/2 d) 8-1/3

e) 10001/3 f) 82/3 g) 361/2 x 271/3 h) (1001/2)-3

i) 811/4 ÷ 161/4 j) (4-1/2)2 k) 14/3 l) (10-6)1/3

1. Solve these equations for x:

a) 2x = 8 b) 10x = 1/100 c) 9x = 3 d) 64x = 4

1. Use your calculator to work out the following.

Write down the full answer shown on your calculator

(a) 3.53 (b) 29

(c) Write your answer to part (b) correct to 3 significant figures.

1. Work out (a) 72 (b) 2 -6 (c) 7 -2
2. Work out (a) (1/3) -2 (b) (2/5) -1 (c) (1/2) -4
3. Express as a power of 3 (a) 36 x 37 (b) 312 (c) 35\_\_

 310 34 x 310

1. Express as a power of 2 (a) (24)2 (b) 26 x 25 (c) (23 x 24)3

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1. Work out the following without using a calculator and showing all working:

(a) (52 x 54)1/2 (b) (8 x 103) -1/3 (c) (16 x 10 -6)1/3

1. **Without** using a calculator, find the value of these expressions.

Show workings!

a) 491/2  b) 27-1/3  c) 3431/3

d) 10241/5 e) (- 1024)1/5 f) 16-1/2

g) 322/5  h) 645/6 i) 64-2/3

1. Solve these equations:

a) 1211/x = 11 b) 3x = 27 c) 27x = 3

d) 25x = 125 e) x4/3 = 16 f) 32x – 1 = 1/81

1. Simplify as far as possible:

a) (√6)2 b) √2 x √7 c) √5 x √20

d) (√3 +√5)2 e) (√7 - √2)2 f) √14 ÷ √7

1. Evaluate the following:

a) 34 b) 44 c) 210

d) (½)3 e) (-2)3

1. Evaluate the following:

a) 2-1 b) 5-3 c) 1-7

d) (½)-1 e) (¼)-2

1. Simplify the following:

a) 32 x 34 b) 24 x23 c) 43 x 42

d) 35 x 3-4 e) 76 x 7-3

1. Simplify the following:

a) 46 ÷ 42 b) 35 ÷ 33 c) 5-6 ÷ 52

d) (½)4 ÷ (½)-5

1. Replace the \* by indices to make the following correct:

a) 4 = 2\* b) 8 = 2\* c) 3\* = 8

d) ½ = 2\* e) 0.25 = 4\* f) 100,000 = 10\*

g) 0.125 = 8\* h) 0.001 = 10\* i) 1 = 6\*

1. Evaluate the following:

a) 9½ b) 100½ c) 49-½

d) (¼)-2 e) (¼)-½ f) 10½ x 100¼