

Name:

Teacher  
Assessment



**Section A Squares, Cubes, Roots & Index Notation Grade F → C**

1. Work out the difference between the two square numbers in this list of numbers.

6    11    15    21    27    36    48    64

.....  
.....  
.....

Answer .....  
**(Total 2 marks)**

2. From the list of numbers

4    9    20    27    32    51    65    81    125

write down the cube numbers.

.....  
.....

Answer .....  
**(Total 2 marks)**

3. (a) Here is a list of numbers.

4    6    8    9    10    11    12

(i) Write down a prime number from the list.

Answer .....  
**(1)**

(ii) Write down a cube number from the list.

Answer .....  
**(1)**

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

.....

Answer .....  
**(2)**  
**(Total 4 marks)**

4. Write down the values of

(a)  $4^2$

.....

Answer .....

(1)

(b)  $\sqrt{81}$

.....

Answer .....

(1)

(Total 2 marks)

5. (a) Work out  $3^3$

.....  
.....  
.....

Answer .....

(1)

(b) Give an example of a cube number that does **not** divide exactly by three.

.....  
.....  
.....

Answer .....

(1)

(Total 2 marks)

6. Work out

(a)  $5^3$

.....

Answer .....

(1)

(b)  $\frac{8^2}{2^3}$

.....  
.....

Answer .....

(2)(Total 3 marks)

7. (a) Work out the cube of 4.

.....  
.....

Answer .....

(1)

(b) Work out  $2^5$

.....  
.....

Answer .....

(1)

(Total 2 marks)

8. (a) Write down the square root of 49.

.....

Answer .....

(1)

(b) Work out the value of  $10^4$

.....

Answer .....

(1)

(Total 2 marks)

9. (a) Which is larger,  $4^3$  or  $3^4$ ?  
You **must** show your working.

.....  
.....  
.....

Answer .....

(Total 2 marks)

10. Work out the value of  $5^3 - 4^3$ .

.....  
.....  
.....

Answer .....

(Total 2 marks)

11. Glynn says that  $\sqrt{16+9}$  is the same as  $\sqrt{16} + \sqrt{9}$ . Show that Glynn is wrong.

.....  
 .....

(Total 2 marks)

12. Which is greater,  $3^2$  or  $\sqrt{70}$ ? You must show your working.

.....  
 .....

Answer .....

(Total 3 marks)

13. Estimate  $\sqrt{97}$  giving your answer to the nearest whole number.

.....  
 .....

Answer .....

(Total 1 mark)

14. James thinks that when you square a number you **always** get an odd number answer.

Give an example to show that James is wrong.

.....  
 .....

Answer .....

(Total 2 marks)

- 15.

Tom says

Sam says



64 is a **square** number



64 is a **cube** number

Tom and Sam are both right. Explain why.

.....  
 .....

(Total 2 marks)

16. Work out  $0.2^2$

.....  
.....

Answer .....

**(Total 1 mark)**

17. Write down the value of  $\sqrt[3]{27}$

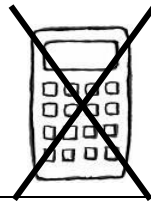
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Answer .....

**(Total 1 mark)**

Success:
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Target:
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**Section B**

**Using Index Laws**

**Grade D / C**

1. Simplify  $t^2 \times t^3$

.....

Answer .....

**(Total 1 mark)**

2. Simplify  $g^4 \times g^4$

.....

Answer .....

**(Total 1 mark)**

3. Simplify

(a)  $m^2 \times m^5$

.....

Answer .....

**(1)**

(b)  $p^6 \div p^3$

.....

Answer .....

**(1)**

(c)  $(q^4)^2$

.....

Answer .....

**(1)**

**(Total 3 marks)**

4. Simplify

(a)  $w^6 \times w^2$

.....

Answer .....

**(1)**

(b)  $x^3 \div x^5$

.....

Answer .....

**(1)**

(c)  $(y^3)^2$

.....

Answer .....

(1)

(Total 3 marks)

5. Simplify

(i)  $y^4 \times y^{-3}$

.....

Answer .....

(1)

(ii)  $y^4 \div y^5$

.....

Answer .....

(1)

(Total 2 marks)

6. Simplify

(i)  $x^5 \times x^{-2}$

.....

.....

Answer .....

(1)

(ii)  $y^5 \div y^{-2}$

.....

.....

Answer .....

(1)

(Total 2 marks)

7. (a) Simplify

(i)  $y^7 \times y^2$

.....

Answer .....

(1)

(ii)  $y^7 \div y^2$

.....

Answer .....

(1)

(iii)  $(y^7)^2$

.....

Answer .....

(1)

(b) (i) If  $y = -1$  which answer in part (a) is positive?

.....

Answer .....

(1)

(ii) If  $y = 0.5$  which answer in part (a) has the greatest value?

.....

Answer .....

(1)

(Total 5 marks)

Success:
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Target:
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**Section C**

**Using Harder Index Laws**

**Grade C → A\***

1. (a) Write down the value of  $9^0$

Answer ..... (1)

- (b) Work out  $10^{-3}$  Give your answer as a decimal.

.....  
.....

Answer ..... (2)

- (c) Work out  $\frac{5^9 \times 5^2}{5^3}$  Give your answer as a power of 5.

.....  
.....  
.....

Answer ..... (2)

**(Total 5 marks)**

2. (a) Find the value of  $64^{\frac{1}{3}}$

.....

Answer ..... (1)

- (b) Find the value of  $8x^0$

.....

Answer ..... (1)

**(Total 2 marks)**

3. (a) Write down the value of  $27^{\frac{1}{3}}$

.....

Answer ..... (1)

(b) Write down the value of  $(4xy)^0$

Answer .....

(1)

(c) If  $2^x = \frac{1}{32}$  find the value of  $x$ .

.....  
.....  
.....

Answer  $x =$  .....

(2)

(Total 4 marks)

4. Write down the value of  $64^{\frac{1}{2}}$

.....

Answer .....

(Total 1 mark)

5. (a) Find the value of  $36^{\frac{1}{2}}$

Answer .....

(1)

(b) Simplify  $2^{-2} \times 81^{\frac{1}{4}}$

.....  
.....  
.....

Answer .....

(3)(Total 4 marks)

6. (a) Write down the value of  $11^0$

.....

Answer .....

(1)

(b) Find the value of  $8^{\frac{2}{3}}$

.....  
.....

Answer .....

(2)

(c) Simplify  $6^{-2} \times 144^{0.5}$

.....  
.....  
.....  
.....

Answer .....

(3)

(Total 6 marks)

7. (a) Express  $128^{-\frac{3}{7}}$  as a fraction.

.....  
.....  
.....  
.....  
.....

Answer .....

(2)

(b) Express  $\sqrt{\frac{3^8}{3^{-4}}}$  in the form  $3^p$

.....  
.....

Answer .....

(2)

(Total 4 marks)

8. Evaluate

(a)  $36^{\frac{1}{2}} \times 4^{-1}$

.....

Answer .....

(3)

(b)  $1000^{-\frac{2}{3}}$

.....  
.....

Answer .....

(2)(Total 5 marks)

9. Simplify fully

(a)  $8 \times 8^0 \times 8^{-1}$

.....  
.....

Answer ..... (2)

(b)  $5^{-2} \times (5^{\frac{1}{3}})^3$

.....  
.....

Answer ..... (2)

(Total 4 marks)

10. (a) (i) Find the value of  $x$  in  $4^x = \frac{1}{16}$

.....  
.....

Answer ..... (1)

(ii) Find the value of  $y$  in  $8^y = 2$

.....  
.....

Answer ..... (1)

(b) Write down the value of  $27^{\frac{2}{3}}$

.....  
.....  
.....

Answer ..... (2)

(Total 4 marks)

11. (a) (i) Evaluate  $13z^0$

Answer ..... (1)

(ii) Evaluate  $(13z)^0$

Answer ..... (1)

(b) If  $3^x = \frac{1}{27}$ , find the value of  $x$ .

.....  
.....

Answer  $x =$  ..... (2)

(Total 4 marks)

12. (a) Work out the exact value of  $(\sqrt{3})^4$

.....  
.....

Answer ..... (1)

(b) Write  $\sqrt{32}$  in the form  $2^p$

.....  
.....

Answer ..... (2)

(c) Find the value of  $(0.25)^{-1}$

.....  
.....

Answer ..... (1)

(d) Find the value of  $81^{-\frac{3}{4}}$ . Leave your answer as a fraction.

.....  
.....

Answer ..... (2)

(Total 6 marks)

13. (a) Calculate the value of  $64^{-\frac{1}{2}}$ , giving your answer as a fraction in its simplest form.

.....  
.....

Answer .....

(2)

- (b) Write 32 in the form  $4^b$

.....  
.....

Answer .....

(2)

(Total 4 marks)

14. (a) Work out  $49^{\frac{1}{2}} \times 5^{-3}$

Give your answer as a fraction.

.....

Answer .....

(2)

- (b) Calculate  $\frac{4^7}{4^{-2}}$  giving your answer in the form  $2^n$ .

.....  
.....

Answer .....

(2)

(Total 4 marks)

15. Write  $27^{-\frac{2}{3}}$  in the form  $\frac{1}{n}$  where  $n$  is an integer.

.....  
.....  
.....

Answer .....

(Total 2 marks)

16. Express  $32^{\frac{-3}{5}}$  as a fraction.

.....  
.....

Answer .....

(Total 2 marks)

17. (a) Evaluate  $16^{\frac{1}{4}} \times 5^{-2} \times 36^0$

You **must** show your working.

.....  
.....  
.....  
.....

Answer .....

(4)

(b) Write  $64^{\frac{-2}{3}}$  as a fraction.

.....  
.....  
.....

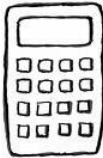
Answer .....

(2)

(Total 6 marks)

Success:
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Target:
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**Section D**                      **Using your Calculator**                      **Grade E → C**

1. (a) Calculate  $\sqrt{9.61}$   
.....  
Answer ..... (1)

(b) Calculate  $\sqrt{9.61} + 2.9^2$   
.....  
Answer ..... (1)(Total 2 marks)

2. (a) Calculate  $2.7^2 + \sqrt{3.5}$   
.....  
Answer ..... (1)

(b) Calculate the cube of 4.2  
.....  
Answer ..... (1)(Total 2 marks)

3. (a) Find the square of 27.5  
.....  
Answer..... (1)

(b) Find the square root of 196  
.....  
Answer..... (1)

(c) Find the value of  $\frac{1}{0.4} - \frac{1}{1.6}$   
.....  
.....  
Answer..... (3)(Total 5 marks)



4. (a) Calculate the cube of 8.7

.....

Answer .....

(1)

- (b) Calculate  $\sqrt{\frac{7}{2.3}}$

.....

Answer .....

(1)

- (c) Calculate  $\frac{(8.7+4.2)}{1.75}$

.....

Answer .....

(1)(Total 3 marks)

5. (a) Work out  $3.7^2$

.....

Answer .....

(1)

- (b) Work out  $3 \div 0.7^2$

- (i) Write down the full calculator display.

Answer .....

(1)

- (ii) Give your answer to the nearest whole number.

Answer .....

(1)

- (c) (i) Calculate  $\frac{9.8}{6.7-1.2}$

Answer .....

(1)

- (ii) Give your answer to an appropriate degree of accuracy.

Answer .....

(1)

(Total 5 marks)

6. (a) Use your calculator to find the square root of 2116.

.....

Answer .....

(1)

- (b) Use your calculator to work out  $\frac{1}{\sqrt{2116}}$

- (i) Write down your full calculator display.

.....

Answer .....

(1)

- (ii) Give your answer to 3 decimal places.

.....

Answer .....

(1)

(Total 3 marks)

7. (a) Find the square root of 1225.

.....

Answer .....

(1)

- (b) Find the value of  $\frac{1}{\sqrt{1225}}$

Give your answer to 3 decimal places.

.....

Answer .....

(2)

(Total 3 marks)

8. Work out  $7.5^2 + 0.4^3$

- (a) Write down your full calculator display.

.....

Answer .....

(1)

- (b) Write your answer to one decimal place.

Answer .....

(1)

(Total 2 marks)

9. (a) Work out  $3.1^2$

Answer ..... (1)

(b) Calculate  $\frac{10.2}{4.1 \times 1.8}$

(i) Write down your full calculator display.

Answer ..... (1)

(ii) Write your answer to 1 decimal place.

Answer ..... (1)(Total 3 marks)

10. Work out  $2.4 \div 1.8^2$

(i) Write down the full calculator display.

Answer ..... (1)

(ii) Give your answer to the nearest whole number.

Answer ..... (1)(Total 2 marks)

11. (a) Work out  $\frac{4.5}{0.6^2}$  .....

Answer ..... (1)

(b) Hassan says



When you square a positive number the answer is **always** bigger than the original number.

For example

$2.5^2 = 6.25$  and 6.25 is bigger than 2.5

Find an example to show that Hassan is wrong. You **must** show your working.

.....  
.....

(2)(Total 3 marks)

Success:

Target: