

## Year 12 Intro 2

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### Question 1

Evaluate  $8^{\frac{5}{3}}$  ..... (2 marks)

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### Question 2

Express  $\frac{1}{\sqrt[3]{x}}$  in the form  $x^n$  ..... (2 marks)

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### Question 3

Find the value of  $\left(\frac{1}{5}\right)^{-3}$  ..... (2 marks)

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### Question 4

One of the following is equal to  $\sqrt{9^{16x^2}}$  for all values of  $x$ .  
Which one?

- $3^{4x}$                         $3^{4x^2}$                         $3^{8x^2}$   
  $9^{4x}$                         $9^{8x^2}$

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### Question 5

Simplify  $\sqrt{x^5 \times x^9}$ . Give your answer in the form  $x^p$  where  $p$  is an integer.  
..... (2 marks)

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### Question 6

Which of these has the smallest value?

- $2016^{-1}$                         $2016^{-1/2}$                         $2016^0$   
  $2016^{1/2}$                         $2016^1$
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**Question 7**

$\frac{(a^r)^2}{(a^t)^3}$  can be written in the form  $a^u$

Find an expression for  $u$  in terms of  $r$  and  $t$ .

$u = \dots\dots\dots$  (2 marks)

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**Question 8**

$(13^{-6})^4 \times 13^5 = 13^k$  Find the value of  $k$ .

$\dots\dots\dots$  (2 marks)

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**Question 9**

Write  $\sqrt{\frac{1}{m^6}}$  as a single power of  $m$

$\dots\dots\dots$  (2 marks)

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**Question 10**

Write  $\frac{\sqrt[3]{81}}{3}$  in the form  $3^k$ , where  $k$  is a constant to be found.

$\dots\dots\dots$  (3 marks)

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**Question 11**

Given that  $3^x = 9^{x+1}$  work out the value of  $x$

$\dots\dots\dots$  (2 marks)

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**Question 12**

$128 = 4^{2x} \times 2^x$  Work out the value of  $x$

$\dots\dots\dots$  (3 marks)

**Question 13**Simplify  $\sqrt{20}$ 

..... (1 mark)

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**Question 14**Write  $\sqrt{50}$  in the form  $k\sqrt{2}$ , where  $k$  is an integer.

..... (1 mark)

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**Question 15**Simplify  $\sqrt{x^6 y^{10}}$ , giving your answer in terms of  $x$  and  $y$ 

..... (2 marks)

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**Question 16**Fully simplify  $6\sqrt{2} + 2\sqrt{18}$ 

..... (1 mark)

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**Question 17**Expand  $(2 + \sqrt{3})(1 + \sqrt{3})$ Give your answer in the form  $a + b\sqrt{3}$ , where  $a$  and  $b$  are integers.

..... (2 marks)

**Question 18**

Work out  $(2 + \sqrt{3})(2 - \sqrt{3})$  Give your answer in its simplest form.

..... (2 marks)

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**Question 19**

Expand  $(5 + 3\sqrt{2})^2$

Give your answer in the form  $(a + b\sqrt{2})$ , where  $a$  and  $b$  are integers.

..... (2 marks)

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**Question 20**

Expand and simplify  $(\sqrt{5} + 3)(\sqrt{5} - 2)(\sqrt{5} + 1)$

..... (4 marks)

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**Question 21**

Rationalise the denominator of  $\frac{10}{\sqrt{5}}$

..... (2 marks)

**Question 22**

Express  $\left(\frac{1}{\sqrt{3}}\right)^7$  in the form  $\left(\frac{\sqrt{b}}{c}\right)$  where  $b$  and  $c$  are integers.

..... (3 marks)

**Question 23**

Evaluate:  $\frac{2}{\sqrt{2}} - \sqrt{2}$

..... (2 marks)

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**Question 24**

Write  $\frac{14}{\sqrt{7}}$  in the form  $b\sqrt{c}$

..... (2 marks)

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**Question 25**

Rationalise the denominator  $\frac{\sqrt{2}}{1-\sqrt{3}}$

..... (3 marks)

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**Question 26**

Rationalise the denominator  $\frac{5-\sqrt{3}}{1+\sqrt{3}}$

..... (3 marks)

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**Question 27**

Rationalise the denominator and simplify  $\frac{5\sqrt{5}-2}{2\sqrt{5}-3}$

..... (4 marks)