

Website: contoureducation.com.au | Phone: 1800 888 300 Email: hello@contoureducation.com.au

# VCE Mathematical Methods ½ Exponentials [5.1] Test

19 Marks. 1 Minute Reading. 20 Minutes Writing

#### **Results:**







### Section A: Test Questions (19 Marks)

Question 1 (3 marks)

Tick whether the following statements are **true** or **false**.

	Statement	True	False
a.	The product law of exponents states that $a^{m+n} = a^m \times a^n$ for any real numbers $m$ and $n$ .		
b.	The quotient law of exponents states that $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}}$ for any positive integers $m$ and $n$ .		
c.	The power law of exponents states that $(a^m)^n = a^{m \times n}$ for any real numbers $m$ and $n$ .		
d.	Any non-zero number raised to the zero power is equal to one.		
e.	Any number raised to the first power is equal to 0.		
f.	The power of a product rule states that the power of a product is equal to the product of the powers.		

Question 2 (4 marks)

Solve each of the following equations for x.

- **a.**  $3^x = 27$ . (1 mark)
- **b.**  $(2.1)^{x+2} = (2.1)^5$ . (1 mark)
- **c.**  $2^{3x} \times 8^{3x+2} = \left(\frac{1}{64}\right)^{x-5}$ . (2 marks)

**Space for Personal Notes** 



#### VCE Methods ½ Questions? Message +61 440 138 726

Question 3 (6 marks)

Simplify and express each of the following with positive indices.

**a.**  $3^{4n} \times 9^{2n} \times 27^{3n}$ . (1 mark)

**b.**  $\frac{2^{2n} \times 8^{n+1}}{32^n}$ . (1 mark)

	/ <sup>1</sup>	1,-	-2
c.	$(x^{2}y^{-})$	2	. (2 marks)

**d.**  $\frac{\left(16x^6y^{-2}\right)^{-\frac{1}{4}}}{x^{\frac{1}{2}}y^{-\frac{1}{2}}}$ . (2 marks)

Question 4 (3 marks)

Solve the following inequalities for x.

- **a.**  $3^{2x-1} > 9$ . (1 mark)
- **b.**  $2^{\frac{1}{5}\chi+1} \le 8$ . (1 mark)
- **c.**  $\left(\frac{1}{4}\right)^{3x+4} > 16$ . (1 mark)

**Space for Personal Notes** 



#### VCE Methods ½ Questions? Message +61 440 138 726

Question 5 (3 marks)		
Solve the following for $x$ .		
	$3^{2x+2} - 3^{x+2} - 54 = 0$	
Space for Personal Notes		



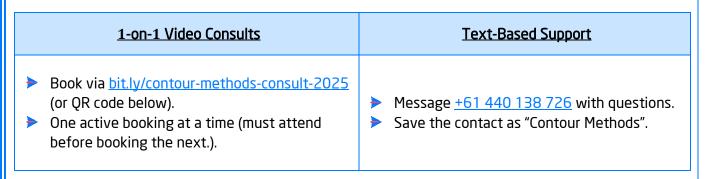
Website: contoureducation.com.au | Phone: 1800 888 300 | Email: hello@contoureducation.com.au

#### VCE Mathematical Methods ½

## Free 1-on-1 Support

#### Be Sure to Make the Most of These (Free) Services!

- Experienced Contour tutors (45 + raw scores, 99 + ATARs).
- For fully enrolled Contour students with up-to-date fees.
- After-school weekdays and all-day weekends.



Booking Link for Consults bit.ly/contour-methods-consult-2025



Number for Text-Based Support +61 440 138 726

