Name:	_KEY	
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Topic: 8.3: The number e Date:

Summary:

Use a calculator to complete the table (round to the 3 decimal places)

n	10	10 <sup>2</sup>	10 <sup>3</sup>	10 <sup>4</sup>	10 <sup>5</sup>	10 <sup>6</sup>
$\left(1+\frac{1}{n}\right)^n$	2.594	2.705	2.717	2.718	2.718	2.718

As n gets larger,  $\left(1+\frac{1}{n}\right)^n$  gets closer to \_\_\_\_\_2.7182818459

This is the value of e

e is also known as <u>natural base e; Euler number</u>.

We can never forget the exponent properties!

## These exponent rules are still applied when the base is e

Simplify the expression.

1. 
$$e^3 \cdot e^4$$
 $e^{3+4}$ 

2. 
$$\frac{10e^3}{5e^2}$$
 2e<sup>3-2</sup>

3. 
$$(3e^{-4x})^2$$
 $3e^{-4x(2)}$ 
 $9e^{-8x}$ 

$$4.\frac{24e^{8}}{8e^{5}} \underbrace{3e^{8-5}}_{3e^{3}}$$

$$e^{8x}$$
5.  $(2e^{-5x})^{-2}$ 

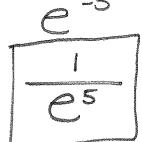
6. 
$$e^{-2} \cdot e^{8}$$
  $e^{-2} \cdot e^{8} = e^{-2}$ 

$$\frac{(2e^{-5x})^2}{2^2e^{-5x(2)}} = \frac{1}{4e^{-10x}}$$

$$\approx \frac{e^{10x}}{4}$$

7. 
$$(2e^5)^3$$

8. 
$$\frac{e^{-3}}{e^2}$$



9. 
$$-3e \cdot (4e)^{-2}$$

$$\frac{-3e}{(4e)^2} = \frac{-3e}{4^2e^2} =$$

11. 
$$e^{2x} \cdot e^{1-2x}$$



13. 
$$e^2(2e^4)^3$$

$$e^{2}2^{3}e^{4(3)}$$
 $e^{2}8e^{12}$ 

10. 
$$2e^x \cdot e^{(x+3)}$$

$$\frac{2e^{x+(x+3)}}{2e^{2x+3}}$$

$$12. \ \frac{e}{e^{(x+1)}}$$

$$e^{1-(X+1)}$$

$$e^{-x}$$

$$14. \left(\frac{e^2}{2}\right)^{-3}$$

