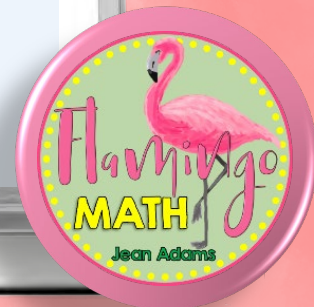
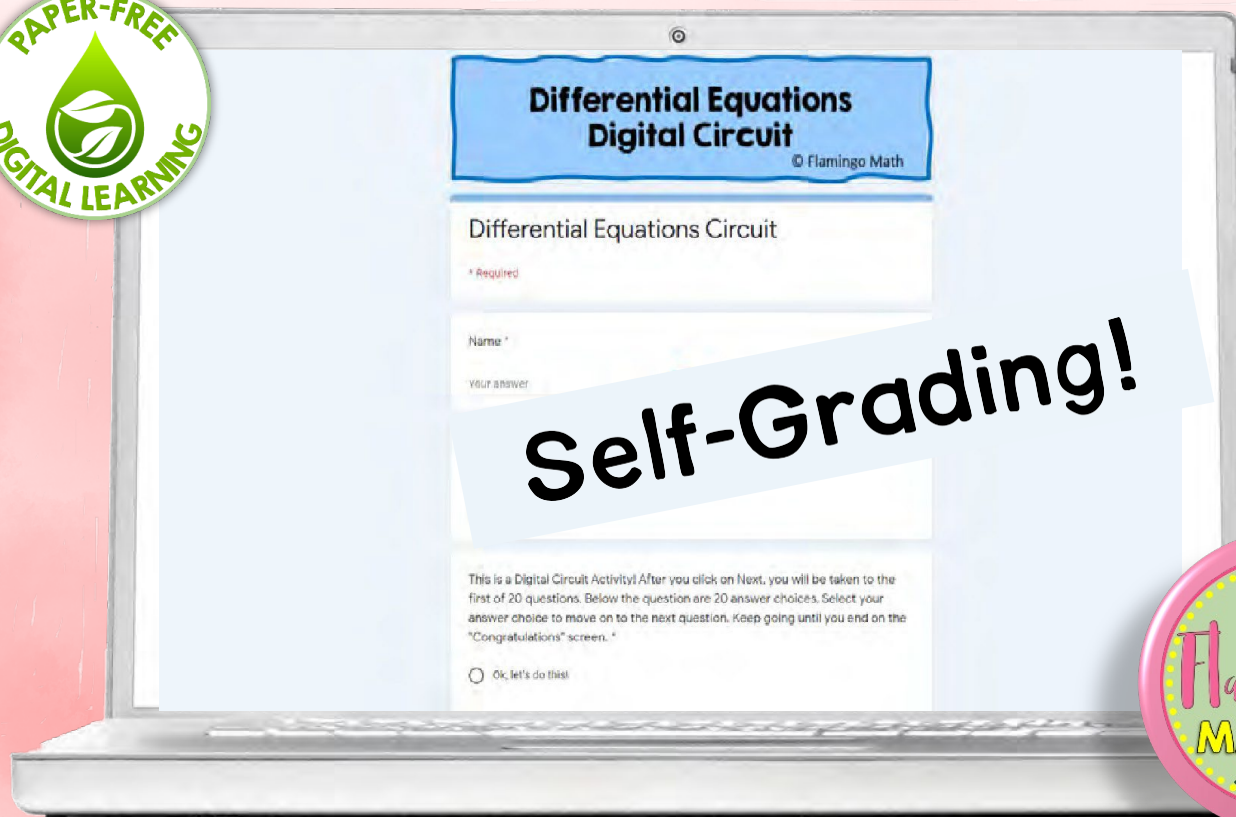


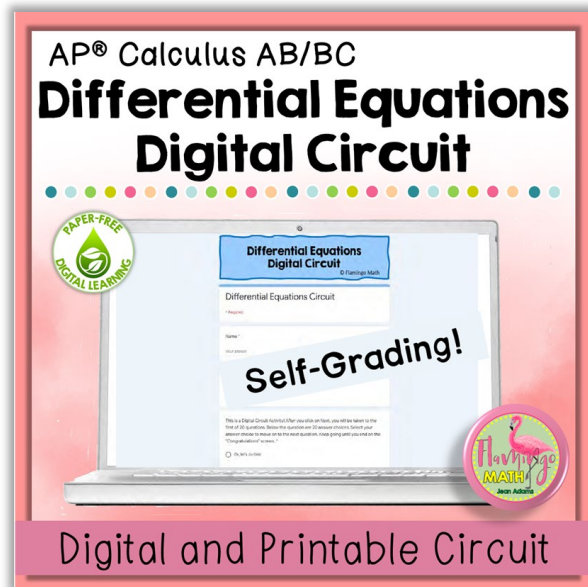
AP[®] Calculus AB/BC

Differential Equations

Digital Circuit



Digital and Printable Circuit



Differential Equations Digital Circuit-Training with Google Forms™

Your AP Calculus students will have 20 self-grading questions related to on topics covering differential equations.

Students will answer prompts for differential equations that include:

- ✓ Growth and Decay
- ✓ Half-life
- ✓ Separation of Variables
- ✓ Solving differential equations for particular solutions
- ✓ Find characteristics of functions given a differential equation

NOTE: You and your students must have a free Google account in order to access and interact with the activity. It is not necessary to use Google Classroom to use this resource.

GOOGLE FORMS™ are editable. This offers you flexibility to add, delete, or edit questions. You can also adjust the point value for each question to meet your needs.



Differential Equations Digital Circuit

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Section 1 of 22

Differential Equations Circuit

Form description



Question #1

There are 20 answer choices. Select your answer choice to move on to the next question. Keep going until you end on the "Congratulations" screen. If you solve the problems in the correct order, you will end on the "Congratulations" screen after the 20th question.

Question #2 *

Solve the differential equation: $y' = \frac{x}{y}$

☐ F

$$y = \sqrt{x^2 + C}$$

☐ D

$$y = C(x + 3)^5$$

☐ A

$$y = \tan^{-1}(2x) + C$$

Question #6

There are 20 answer choices. Select your answer choice to move on to the next question. Keep going until you end on the "Congratulations" screen. If you solve the problems in the correct order, you will end on the "Congratulations" screen after the 20th question.

Question #6

Find the particular solution: $\frac{dy}{dx} = 3y; y(0) = 2$

☐ F

$$y = \sqrt{x^2 + C}$$

☐ D

$$y = C(x + 3)^5$$

☐ A

Name: _____ Date: _____ Period: _____

Circuit Training - Differential Equations

Directions: Begin in Cell #1, evaluate the following problem. Search for your answer and mark that cell #2. Continue in this manner until you finish the circuit.

Answer: $y = \ln|\tan x + 1| + 4$

#1

Solve the differential equation:

$$\frac{dy}{dx} = \frac{x}{y}$$

Answer: $y = 2e^{3x}$

Find the particular solution:

$$\frac{dy}{dx} = \frac{e^x}{y}; y(0) = 6$$

Answer: $x = \pm\sqrt{2e^t - 1}$

Find the particular solution:

$$\sqrt{y} \frac{dy}{dx} = \sqrt{x}; y(1) = 4$$

Answer: 59

Answer: 59

A population, P , grows according to the equation $\frac{dP}{dt} = kP$ where k is a constant, and t is measured in years. Find the value of k if the population doubles every 8 years.



Answer: $y = \pm\sqrt{2e^x + 34}$

Find the particular solution:

$$\frac{dy}{dx} = \frac{x + \cos x}{2y}; y(0) = -$$

Answer: $y = C(x - 1)$

Solve the differential equation:

$$(1 + 9x^2) \frac{dy}{dx} = 3$$

Answer: $y = \frac{1}{\sqrt{x-2}}$

Answer: $y = \frac{1}{\sqrt{x-2}}$

Solve the differential equation:

$$\frac{dy}{dx} = \frac{\sec^2 x}{\tan x}; \text{ through the point } (\pi, 4)$$

Answer: $y = \pm \sqrt{\frac{1}{2}x^2 + \sin x + 4}$

Solve the differential equation:

$$\frac{dx}{dt} = e^{x+t}; x(0) = 1$$

Answer: $y = \sqrt[3]{(x^{\frac{5}{2}} + 7)^2}$

An initial population of 1000 E. coli bacteria grows exponentially in a petri dish with a growth constant of $k = 0.409$. How large is the population after 5 hours?



Answer: $y = \sqrt{x^2 + C}$

Solve the differential equation:

$$(3 + x) \frac{dy}{dx} = 5y$$

Answer: $y = \pm\sqrt{C - 2 \cos x}$

Solve the differential equation:

$$\frac{dy}{dx} = xy$$

Answer: 0.086643

The number of bacteria in a culture is growing at a rate of $2000e^{\frac{2t}{3}}$ per unit of time. At $t = 0$, the number of bacteria present is 5,200. Find the number present at $t = 5$.



Answer: $y = \tan^{-1}(x) + C$

Solve the differential equation:

$$\frac{dy}{dx} = \frac{x}{y}$$

Answer: 37,145,280

Find the particular solution:

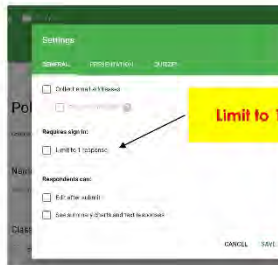
$$\frac{dy}{dx} = \frac{x}{y}; x(3) = 4$$

SELF-GRADING

First, The Basics:

- 1.) Have access to the Internet.
- 2.) Have a Google account – this is FREE and easy to create.
- 3.) Every student who uses the activity needs their own Google Account and the Google Forms App.
- 4.) Students can submit their finished school is one-to-one. Using Google Forms is not a requirement.
- 5.) If you want to make a hard copy of the form, you can print it.

Click the Gear and Check Settings



Changing Point Values:

Every question is set at a value of 1 point each.

16 questions show total points: Total points: 16

To alter the point values:

- 1.) Click on any question.
- 2.) Click ANSWER KEY (located at the bottom of the question).
- 3.) Click on arrow up/down to change the point value.

Self-Grading

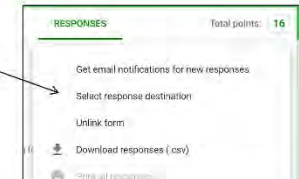
From your teacher copy you can see the GOOGLE SHEET to track student data.

On the RESPONSES TAB:

Click the three vertical dots (snowman) to begin the set-up for creating a spreadsheet.

Self-Grading Set-Up & Spreadsheet:

Click **SELECT RESPONSE DESTINATION**. Then create a new spreadsheet. This will create the spreadsheet and will save by default to your GOOGLE DRIVE Folder

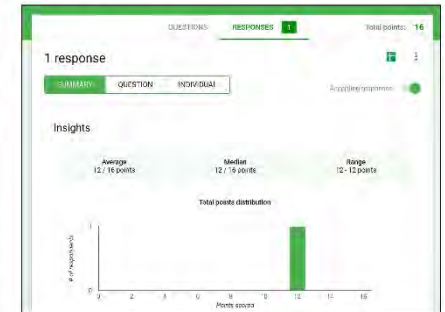


To view the student responses on the spreadsheet click here:

Viewing Student Responses:

Teachers can check responses through the **RESPONSE Tab** using a bar graph **SUMMARY**, a **QUESTION** report or an **INDIVIDUAL** student report.

If you choose to create a GOOGLE SHEET, the data will also be collected for students in the **SPREADSHEET**, which will allow sorting and an overview of all responses as shown below.



Polynomial and Rational Functions (Responses)				
File Edit View Insert Format Data Tools Form Add-ons Help				
Working...				
Timestamp	A	B	C	D
1	Timestamp	Score	Name	Class Period
2	10/26/2019 7:54:10	11 / 16	Jean Adams	1st period
3				
4				

Low Prep



Step-by-Step Instructions

THANK YOU!

www.FlamingoMath.com

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You May

- ☐ Use the product for personal use.
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- ☐ Share images of the product in action on your social media sites, as long as you provide a link back to my store or the product in my store.

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 Jean

