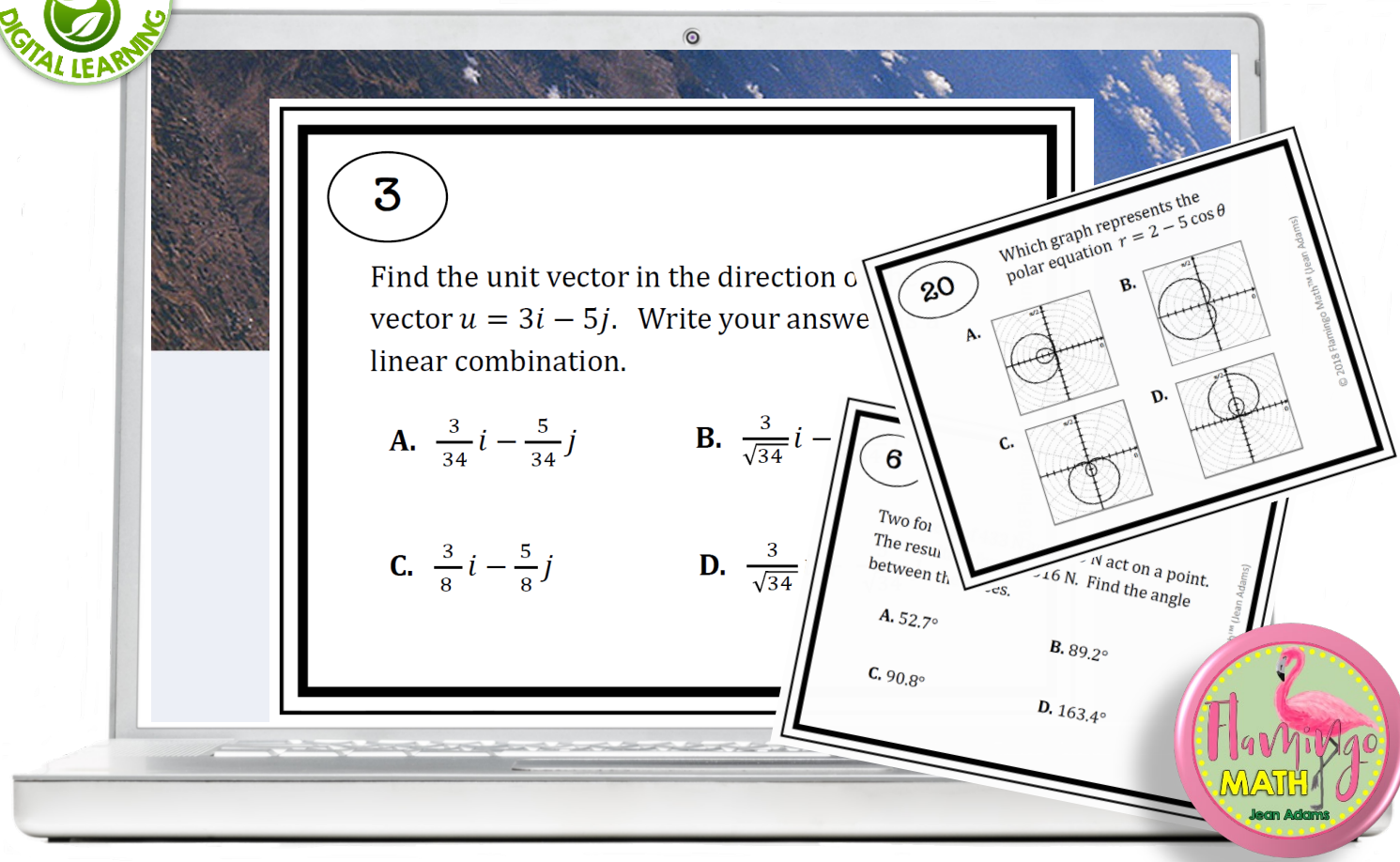
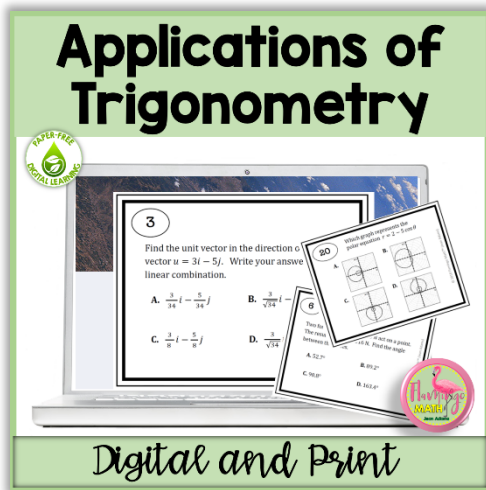


Applications of Trigonometry



Digital and Print



Applications of Trigonometry with Google Forms

Your Precalculus students will have 20 self-grading questions related to your Applications of Trigonometry topics.

This set of **20 DIGITAL TASK CARDS** is designed for students in PreCalculus. Students can interact with the activity on their one-to-one devices in a variety of ways. This 20-question activity is in multiple choice format with task cards presented on **Google Forms** for a self-grading set.

Students will answer prompts for Applications of Trigonometry that include:

- ☒ Vector operations
- ☒ Dot Product
- ☒ Polar Form
- ☒ Converting from Polar to Rectangular form
- ☒ Converting from Rectangular to Polar form
- ☒ Write complex numbers in trigonometric form
- ☒ Product and Quotient of Complex Numbers
- ☒ DeMoivre's Theorem
- ☒ Polar Graphing
- ☒ Application problems

There is also a set of blackline master mini-task cards to create a paper and pencil lesson if you are in need of this feature, along with a student recording sheet if you want to collect student work, and an answer key.

***NOTE: YOU AND YOUR STUDENTS MUST HAVE ACCESS TO THE INTERNET TO BEGIN TO INTERACT WITH THE LESSON!**



1

Given that $P = (-3, 4)$ and $Q = (-4, 7)$, find the component form and magnitude of the vector $\overrightarrow{QP}$.

- A. $\langle -7, -3 \rangle$ B. $\langle -1, 3 \rangle$
C. $\langle 1, -3 \rangle$ D. $\langle 1, -3 \rangle$

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2

Let $u = \langle -6, 1 \rangle$, $v = \langle -4, 5 \rangle$. Find component form of $5u + 3v$.

- A. $\langle -50, 20 \rangle$ B. $\langle -18, -20 \rangle$
C. $\langle -42, 20 \rangle$ D. $\langle -42, 4 \rangle$

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5

Find the magnitude and direction angle for the vector $\langle 9\sqrt{3}, -9 \rangle$

- A. 18, 330° B. 18, 150°
C. 27, 210° D. 27, 150°

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6

Two forces of 433 N and 275 N act on a point. The resultant force is 516 N. Find the angle between the forces.

- A. 52.7° B. 89.2°
C. 90.8° D. 163.4°

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3

Find the unit vector in the direction of the vector $u = 3i - 5j$. Write your answer as a linear combination.

- A. $\frac{3}{34}i - \frac{5}{34}j$ B. $\frac{3}{\sqrt{34}}i - \frac{5}{\sqrt{34}}j$
C. $\frac{3}{8}i - \frac{5}{8}j$ D. $\frac{3}{\sqrt{34}}i + \frac{5}{\sqrt{34}}j$

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4

Find the component form of a vector with magnitude of 41 in the direction of 220° .

- A. $v \approx \langle -0.64, -0.77 \rangle$
B. $v \approx \langle -0.64, -0.77 \rangle$
C. $v \approx \langle -0.64, -0.77 \rangle$
D. $v \approx \langle -0.64, -0.77 \rangle$

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7

Find a vector $a = \langle -8, \dots \rangle$ such that $a \cdot b = 0$ where $b = \langle -6, -4 \rangle$.

- A. $\langle -6, -4 \rangle$
B. $\langle -6, -4 \rangle$
C. $\langle -20, -8 \rangle$
D. $\langle -20, -8 \rangle$

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8

Given the vector $v = \langle 5, 2 \rangle$, which vector is orthogonal to v ?

- A. $\langle -2, -5 \rangle$ B. $\langle -4, 10 \rangle$
C. $\langle 10, -4 \rangle$ D. $\langle -5, -2 \rangle$

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9

In polar form, which of the following is NOT a correct representation of the point $(-2, \frac{5\pi}{4})$?

- A. $(-2, -\frac{3\pi}{4})$ B. $(-2, -\frac{7\pi}{4})$
C. $(2, \frac{\pi}{4})$ D. $(2, -\frac{15\pi}{4})$

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10

Without the wind, a plane would fly due east at a speed of 150 mph. The wind is blowing from the southeast at a rate of 50 mph. The wind is blowing at an angle from due east. How far does the plane's path does the wind blow the plane?

- A. 10.8 B. 8.2
C. 7.5 D. 5.3

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13

Convert the polar equation to rectangular form:

$$r = \frac{3 \sin \theta}{\cos \theta}$$

- A. $3x - 6y = 36$ B. $3y + 6x = 6$
C. $3x + 6y = 6$ D. $3y + 6x = \frac{6}{\sqrt{x^2 + y^2}}$

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14

Convert the rectangular equation to polar form $x^2 + y^2 = 121$

- A. $r = 11 \cos \theta$ B. $r = 11 \sin \theta$
C. $r = 11$ D. $r = 121$

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11

Convert the polar coordinates $(-4, -\frac{\pi}{3})$ to rectangular coordinates.

- A. $(-2, -2\sqrt{3})$ B. $(2, 2\sqrt{3})$
C. $(2, -2\sqrt{3})$ D. $(-2, 2\sqrt{3})$

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12

Forces of 18 lbs. and 20 lbs. act on an object at 120° . Find the magnitude of the resultant force.

- A. 36.7 lbs. B. 32.9 lbs.
C. 19.1 lbs. D. 10.0 lbs.

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15

Write the complex number in trigonometric form $-2 + 2i$

- A. $2(\cos 225^\circ + i \sin 225^\circ)$
B. $2(\cos 135^\circ + i \sin 135^\circ)$
C. $2\sqrt{2}(\cos 135^\circ + i \sin 135^\circ)$
D. $2\sqrt{2}(\cos 225^\circ + i \sin 225^\circ)$

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16

Find the product of z_1 and z_2 :

$$z_1 = 9 [\cos(-10^\circ) + i \sin(-10^\circ)]$$

$$z_2 = 62 [\cos 105^\circ + i \sin 105^\circ]$$

- A. $558(\cos 95^\circ + i \sin 95^\circ)$
B. $71(\cos 95^\circ + i \sin 95^\circ)$
C. $558[\cos(-1050^\circ) + i \sin(-1050^\circ)]$
D. $558(\cos 115^\circ + i \sin 115^\circ)$

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17

Find the quotient of z_1 and z_2 :

$$\frac{6(\cos 7\pi + i \sin 7\pi)}{3(\cos 4\pi + i \sin 4\pi)}$$

- A. $3(\cos 3\pi + i \sin 3\pi)$
 B. $2\left(\cos \frac{7}{4} + i \sin \frac{7}{4}\right)$
 C. $3\left(\cos \frac{7}{4} + i \sin \frac{7}{4}\right)$
 D. $2(\cos 3\pi + i \sin 3\pi)$

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18

Use DeMoivre's Theorem to find the indicated power of the complex number. Write your answer in standard form $a + bi$.

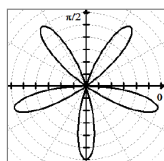
$$[5(\cos 90^\circ + i \sin 90^\circ)]^5$$

- A. $3125i$
 B. $-3125i$
 C. 3125
 D. -3125

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19

Identify the equation for the polar graph, shown below.

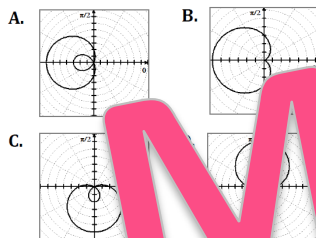


- A. $r = 5 \sin(6\theta)$
 B. $r = -6 \sin(5\theta)$
 C. $r = 5 \cos(6\theta)$
 D. $r = -6 + 5 \cos \theta$

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20

Which graph represents the polar equation $r = 2 - 5 \cos \theta$



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PreCalculus Applications of Trigonometry

Name _____

Calculator ACTIVE

1. Given that $P = (-3, 4)$ and $Q = (-4, 7)$, find the component form and magnitude of the vector $\overrightarrow{QP}$.

- A. $(-7, -3)$, $\sqrt{2}$ B. $(-1, 3)$, $\sqrt{10}$ C. $(1, -3)$, 10 D. $(1, -3)$, $\sqrt{10}$

2. Let $u = (-6, 1)$, $v = (-4, 5)$. Find component form of $5u + 3v$.

- A. $(-50, 20)$ B. $(-18, -20)$
 C. $(-42, 20)$ D. $(-42, 4)$

3. Find the direction of the vector $u = \left(\frac{5}{13}i - \frac{12}{13}j\right)$. Write your answer as a linear combination of i and j .

- A. $\frac{5}{13}i - \frac{12}{13}j$ B. $-\frac{5}{13}i - \frac{12}{13}j$
 C. $\frac{5}{13}i + \frac{12}{13}j$ D. $-\frac{5}{13}i + \frac{12}{13}j$

4. Find the component form of a vector with magnitude of 41 and direction of 220° .

- A. $v = (-0.64, -0.77)$ B. $v = (-0.77, -0.64)$
 C. $v = (-31.41, -26.35)$ D. $v = (-26.35, -31.41)$

13. Convert the polar equation to rectangular form, $r = \frac{6}{1 \sin \theta + 5 \cos \theta}$.

- A. $3x - 6y = 36$ B. $3y + 6x = 6$
 C. $3x + 6y = 6$ D. $3y + 6x = \frac{6}{\sqrt{2}e^{2\pi}}$

14. Convert the rectangular equation to polar form, $x^2 + y^2 = 121$.

- A. $r = 11 \cos \theta$ B. $r = 11 \sin \theta$
 C. $r = 11$ D. $r = 121$

Write the complex number in trigonometric form $-2 + 2i$.

- A. $2(\cos 225^\circ + i \sin 225^\circ)$ B. $2(\cos 135^\circ + i \sin 135^\circ)$
 C. $2\sqrt{2}(\cos 135^\circ + i \sin 135^\circ)$ D. $2\sqrt{2}(\cos 225^\circ + i \sin 225^\circ)$

16. Find the product of z_1 and z_2 .

$$z_1 = 9[\cos(-10^\circ) + i \sin(-10^\circ)] \quad z_2 = 62[\cos 105^\circ + i \sin 105^\circ]$$

- A. $558(\cos 95^\circ + i \sin 95^\circ)$ B. $71(\cos 95^\circ + i \sin 95^\circ)$

Name _____ Date _____ Period _____

PRECALCULUS

TEST #6-A

1. ☐ A ☐ B ☐ C ☐ D
 2. ☐ A ☐ B ☐ C ☐ D
 3. ☐ A ☐ B ☐ C ☐ D
 4. ☐ A ☐ B ☐ C ☐ D
 5. ☐ A ☐ B ☐ C ☐ D
 6. ☐ A ☐ B ☐ C ☐ D
 7. ☐ A ☐ B ☐ C ☐ D
 8. ☐ A ☐ B ☐ C ☐ D
 9. ☐ A ☐ B ☐ C ☐ D
 10. ☐ A ☐ B ☐ C ☐ D

11. ☐ A ☐ B ☐ C ☐ D
 12. ☐ A ☐ B ☐ C ☐ D
 13. ☐ A ☐ B ☐ C ☐ D
 14. ☐ A ☐ B ☐ C ☐ D
 15. ☐ A ☐ B ☐ C ☐ D
 16. ☐ A ☐ B ☐ C ☐ D
 17. ☐ A ☐ B ☐ C ☐ D
 18. ☐ A ☐ B ☐ C ☐ D
 19. ☐ A ☐ B ☐ C ☐ D
 20. ☐ A ☐ B ☐ C ☐ D

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