

Test: ALPHA
Points: 15 points
Name: _____
Date: _____

NOTA = None of these answers is correct.

Question 1 of 15

1 pt

If the polar coordinate $(-1, \frac{\pi}{4})$ and the rectangular coordinate $(\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ are on the same parabola, which of the following lines could be an axis of symmetry for the parabola?

A) $y=0$

B) $x=0$

C)

$$y = \frac{\sqrt{2}}{2}$$

D)

$$y = -\frac{\sqrt{2}}{2}$$

E) NOTA

Question 2 of 15

1 pt

What point is the center of the conic section $x^2 + y^2 + 2x + 2y = 1$?

- A) (1, 1)
- B) (-1, 1)
- C) (-1, -1)
- D) (1, -1)
- E) NOTA

Question 3 of 15

1 pt

What is the area of the conic section in question 2?

- A) 2π
- B) $\frac{\pi}{2}$
- C) $\sqrt{3}\pi$
- D) $\frac{\sqrt{3}\pi}{3}$
- E) NOTA

The oblique asymptote to the function in question four will never touch the hyperbola itself. But which of the following is an intersection between the line parallel to the oblique asymptote with y-intercept 0 and the function?

A)

$$\left(5, -\frac{5}{4} \right)$$

B)

$$\left(5, \frac{13}{4} \right)$$

C)

$$\left(\frac{20}{3}, 5 \right)$$

D)

$$\left(\frac{23}{3}, 5 \right)$$

E) NOTA

What is the measure (in radians) of the acute angle created by the intersection of the oblique asymptotes of the hyperbola?

A)

$$\tan^{-1}\left(\frac{3}{4}\right)$$

B)

$$2 \tan^{-1}\left(\frac{3}{4}\right)$$

C)

$$\frac{\pi}{2} - \tan^{-1}\left(\frac{3}{4}\right)$$

D)

$$\pi - 2 \tan^{-1}\left(\frac{3}{4}\right)$$

E) NOTA

Question 6 of 15

1 pt

Given polynomial $P(x)$ find the product of the roots taken two at a time.

$$P(x) = x^3 - 4x^2 + 10x - 16$$

-
- A) 40
 B) 64
 C) 160
 D) 256
 E) NOTA

Question 7 of 15

1 pt

Which of the following are true about proving similar/congruent triangles?

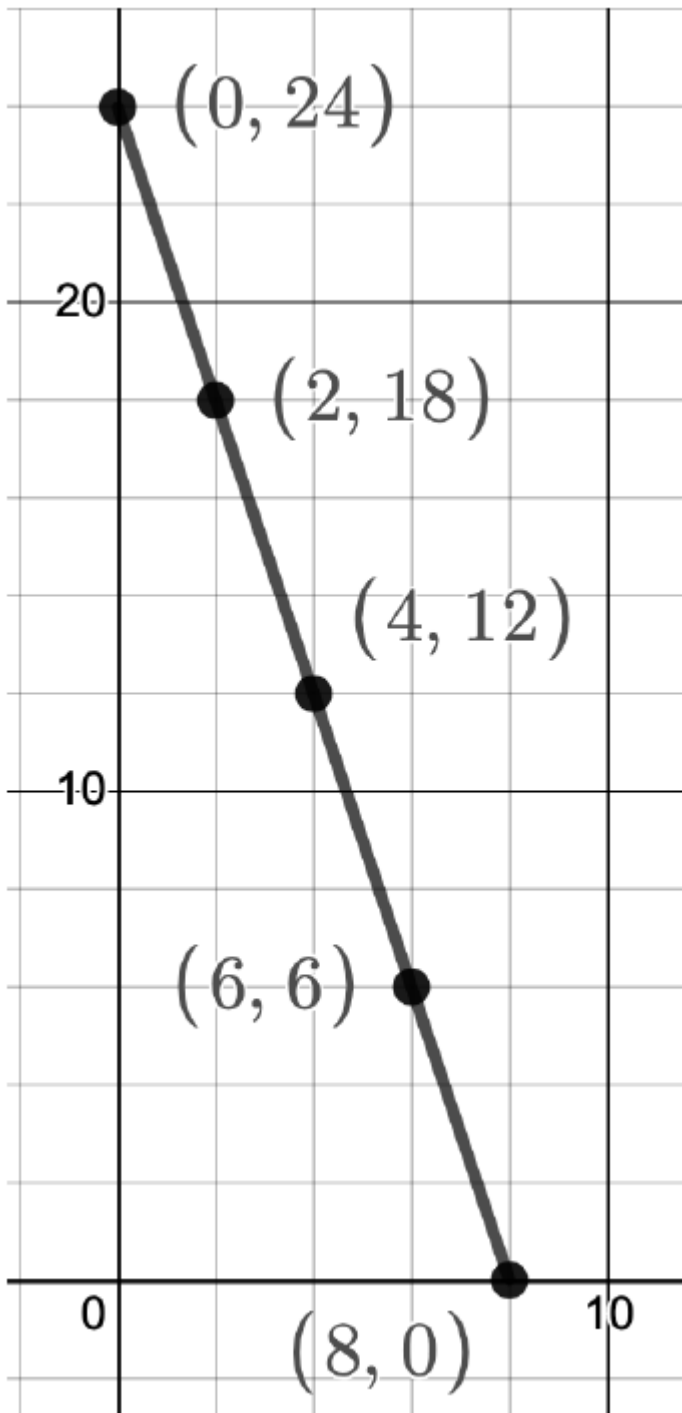
- I. If two angles of a triangle are congruent then the two triangles are similar.
- II. If two pairs of corresponding sides are in proportion and there exists an equal angle that both the triangles share then the two triangles are similar.
- III. If three pairs of corresponding sides are in proportion then the two triangles are similar.

-
- A) I only
 B) II and III
 C) I and III
 D) All of the above
 E) NOTA

Compute $\csc\left(\frac{\pi}{12}\right)$

- A) $\sqrt{6} - \sqrt{3}$
- B) $\sqrt{6} + \sqrt{3}$
- C) $\sqrt{6} - \sqrt{2}$
- D) $\sqrt{6} + \sqrt{2}$
- E) NOTA

Which of the following sets of parametric equations does **not** describe the line segment shown?



A)

$$(t, -3t + 24) \mid 0 \leq t \leq 8$$

B) $(\sin t, -3\sin t + 24) \mid -\infty < t < \infty$

C) $(t^2, -3t^2 + 24) \mid 0 \leq t \leq \sqrt{8}$

D) $(e^t, -3e^t + 24) \mid -\infty < t \leq \ln(8)$

E) NOTA

Question 10 of 15

1 pt

Find the center of the polar graph $r = \frac{6}{3 + 2\sin\theta}$ in rectangular coordinates.

-
- A) (0,6/5)
 B) (0,0)
 C) (0,-12/5)
 D) (0,-6)
 E) NOTA

Compute the sum of the solutions to the equation $\tan^2(x) + \frac{4\sqrt{3}}{3}\tan(x) + 1 = 0$ on the interval $[-\pi, \pi]$

-
- A) π
- B) $\frac{2\pi}{3}$
- C) $\frac{5\pi}{6}$
- D) $\frac{7\pi}{6}$
- E) NOTA

What is the area of the intersection of the functions $\sqrt{x^2 + y^2} \leq 5$ and $y \geq \frac{|\sqrt{3}x|}{3}$?

A)

$$\frac{25\pi}{6}$$

B)

$$\frac{25\pi}{2}$$

C)

$$\frac{5\pi}{6}$$

D)

$$\frac{5\pi}{3}$$

E) NOTA

Question 13 of 15

1 pt

Solve for x if the infinite sum $\log_3(x) + \log_9(x) + \log_{81}(x) + \log_{6561}(x) + \dots = 18$.

- A) 3^6
- B) 3^9
- C) 3^{12}
- D) 3^{18}
- E) NOTA

Question 14 of 15

1 pt

Can you crack this code? Include the exact punctuation when you type your answer in the blank:

**Arire tbaan tvir lbh hc, arire tbaan yrg lbh qbja, arire tbaan eha
nebhaq naq qrfreg lbh.**

Question 15 of 15

1 pt

Dear puzzler, here is a list of things: integrals, unlimited breadsticks, scented dryer sheets, praseodymium, a lost pet colony on the moon, a flowing purple cape.

Using all of these unique tools, can you crack this code? Include the exact punctuation when you type your answer in the blank:

M pc lekmgql, pfs sgf'n apbb ce Lymkbex.