DUE ON THE FIRST DAY OF SCHOOL

The problems in this packet are designed to help you review topics from previous mathematics courses that are essential to your success in your next math class. **You are expected to bring this completed packet to class on the first day of school.** In addition, this packet will count as part of your first quarter grade. **Upon returning, you will be ASSESSED on the content of this packet**. All contents outlined in the packet are Pre-Calculus Honors objectives. Neatly **SHOW YOUR WORK** on a separate sheet of paper.

1. Solve the matrix equation

$$A = \begin{bmatrix} 1 & -1 \\ 0 & -3 \\ 5 & 2 \end{bmatrix} \qquad B = \begin{bmatrix} -2 & 1 \\ 5 & 4 \\ 0 & -7 \end{bmatrix}$$

$$A + B = \begin{bmatrix} & \\ & \\ & \end{bmatrix}$$

2 For the given matrix A, evaluate $-2A$.
Type the correct numbers into each blank cell.

$$A = \begin{bmatrix} -5 & 4 & 1 \end{bmatrix}$$

$$-2A = \begin{bmatrix} \boxed{} & \boxed{} & \boxed{} \end{bmatrix}$$

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3 Select the difference matrix below:

$$\begin{bmatrix} 3 & -6 \\ -1 & 5 \\ 4 & -6 \end{bmatrix} - \begin{bmatrix} -2 & 4 \\ -1 & -1 \\ -3 & 2 \end{bmatrix}$$

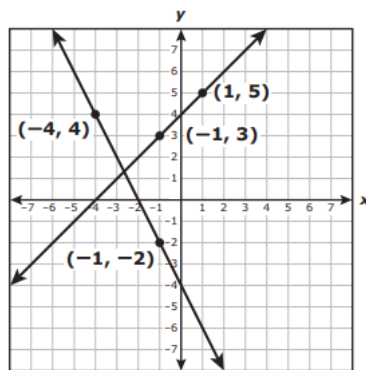(A) $\begin{bmatrix} 1 & 2 \\ -2 & 12 \\ 1 & -4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 4 \\ -2 & -3 \\ 4 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 5 & 10 \\ 0 & -2 \\ 1 & -8 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & -10 \\ 0 & 6 \\ 7 & -8 \end{bmatrix}$

4 Select the difference matrix below:

$$\begin{bmatrix} 3 & -6 \\ -1 & 5 \\ 4 & -6 \end{bmatrix} - \begin{bmatrix} -2 & 4 \\ -1 & -1 \\ -3 & 2 \end{bmatrix}$$

(A) $\begin{bmatrix} 1 & 2 \\ -2 & 12 \\ 1 & -4 \end{bmatrix}$

(B) $\begin{bmatrix} 1 & 4 \\ -2 & -3 \\ 4 & 4 \end{bmatrix}$

(C) $\begin{bmatrix} 5 & 10 \\ 0 & -2 \\ 1 & -8 \end{bmatrix}$

(D) $\begin{bmatrix} 5 & -10 \\ 0 & 6 \\ 7 & -8 \end{bmatrix}$

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6 A system of equations is graphed on the grid.

Which system of equations does the graph represent?

(A) $y = -x - 4$
$y = 2x - 2$

(B) $y = -x + 4$
$y = 2x - 4$

(C) $y = x - 4$
$y = -2x - 2$

(D) $y = x + 4$
$y = -2x - 4$

8 **A system of equations is graphed below.**

What are the solutions to the system?

(A) $(0,\ 5.6)$ and $(0, 13)$

(B) $(0, 13)$ and $(16, 1)$

(C) $(4, 10)$ and $(7, 7.75)$

(D) $(16, 1)$ and $(10, 0)$

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9 Solve the following system of equations.

$-4x - 15y = 17$
$-x + y = -13$

(A) (1,-3)

(B) (8,-1)

(C) (1,8)

(D) (4,3)

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11 **Part A:**

(a) At a clothing store, Ted bought 4 shirts and 2 ties for a total price of $95. At the same time store, Stephen bought 3 shirts and 3 ties for $84. Each shirt was the same price, and each tie was the same price. Which system of equations can be used to find s, the cost of each shirt in dollar, and t, the cost of each tie in dollars ?

(A) $\begin{cases} 6(s + t) = 95 \\ 3(s + t) = 84 \end{cases}$

(B) $\begin{cases} 4s + 2t = 95 \\ 3s + 3t = 84 \end{cases}$

(C) $\begin{cases} 7s + 5t = 179 \\ s + t = 12 \end{cases}$

(D) $\begin{cases} 7s + 5t = 179 \\ 7s + 5t = 12(s + t) \end{cases}$

(b)

Part B:
Linda bought 1 shirt and 2 ties at the same store. What is the total price, in dollars and cents, of Linda's purchase?

Enter your answer in the box.

12 Consider the following equation,

$$A \begin{bmatrix} 1 & 3 \\ 4 & -2 \end{bmatrix} + B \begin{bmatrix} 1 & -5 \\ 1 & 3 \end{bmatrix} + C \begin{bmatrix} 1 & 1 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} 2 & 4 \\ 7 & 0 \end{bmatrix}$$

Determine whether the matrices A, B and C are identity matrices or zero matrices which makes the equation true.

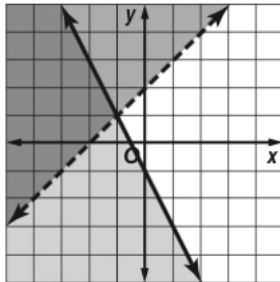| Matrix	Identity matrix	Zero matrix
A	☐	☐
B	☐	☐
C	☐	☐

---

13 Lizzy has 30 coins that total $4.80. All of her coins are dimes, d, and quarters, q. Which system of equations models this situation?

(A) d + q = 4.80
0.10d + 0.25q = 30

(B) d + q = 30
0.10d + 0.25q = 4.80

(C) d + q = 30
0.25d + 0.10q = 4.80

(D) d + q = 4.80
0.25d + 0.10q = 30

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14 Which system of inequalities is graphed below?

(A) $\begin{cases} y > x + 2 \\ y \geq -2x - 1 \end{cases}$

(B) $\begin{cases} y > x + 2 \\ y \leq -2x - 1 \end{cases}$

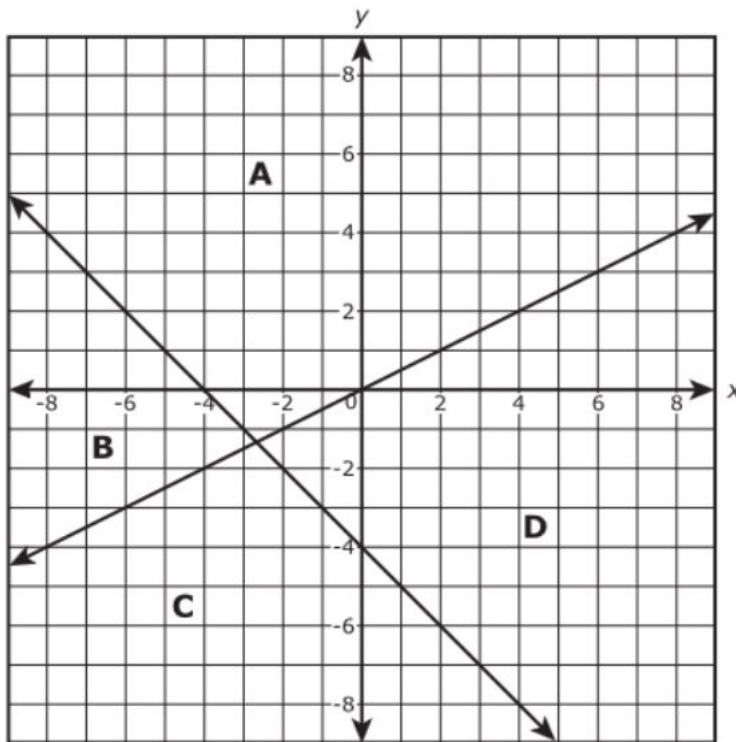(C) $\begin{cases} y \geq x + 2 \\ y < -2x - 1 \end{cases}$

(D) $\begin{cases} y \leq x + 2 \\ y > -2x - 1 \end{cases}$

15 Which of the following is a solution to system of inequalities shown below?

$$5x + 2y > 19$$
$$x + y \geq 5$$

(A) (0, 0)

(B) (0, 1)

(C) (5, 5)

(D) (5, -1)

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16 The system of inequalities $\begin{cases} x + y \leqslant -4 \\ 7x - 14y \leq 0 \end{cases}$ is graphed.

(A) Region A

(B) Region B

(C) Region C

(D) Region D

17

Find the determinant of the following matrix: $\begin{vmatrix} 4 & 2 & 7 \\ 9 & 3 & 5 \\ 7 & 9 & 4 \end{vmatrix}$

(A) 1084

(B) -286

(C) 286

(D) 146

18

(a)

$x - ay - 2z = 0$
$x + y + z = 120$
$6x + 4y + 3z = 610$

Part A:

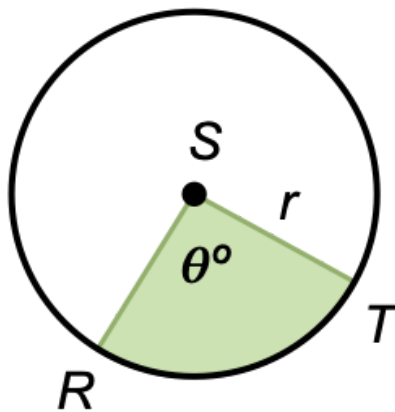For what value of a would the determinant be singular?

(A) 0

(B) 1

(C) 2

(D) 3

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19   Find the area of the shaded sector. Round to the nearest **_tenth_**.

$r = 7.7$ $\qquad\qquad \theta = 90.3$

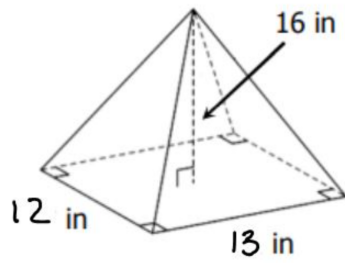**20**   If the measure of one exterior angle of a regular polygon is 12, how many sides does the polygon have?

Formula: $\dfrac{360}{exterior\ angle}$

21 Find the volume of the rectangular pyramid. State the area of the base and the volume.
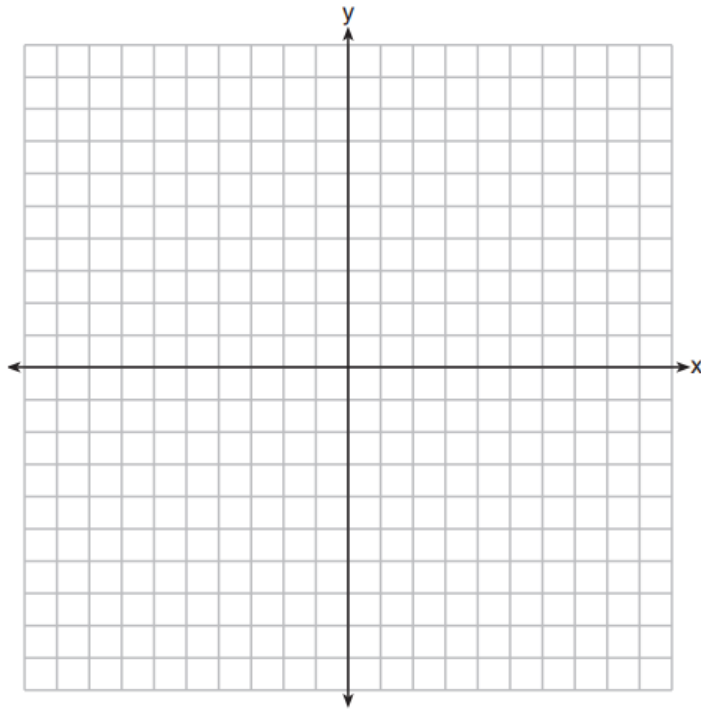
$A = l \cdot w$

$V = \dfrac{1}{3}Bh$

16 in

12 in

13 in

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22 Determine and state the area of triangle PQR, whose vertices have coordinates $P(-2, -5)$, $Q(3, 5)$, and $R(6, 1)$.
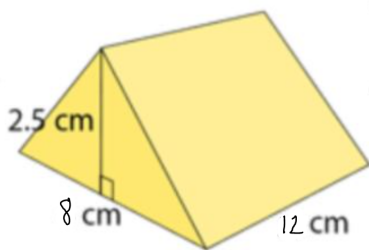[The use of the set of axes below is optional.]

y

x

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23 What is the volume of the triangular prism? Give the area of the base and the volume.
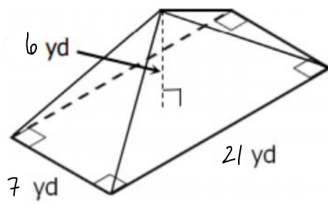
$A = \dfrac{1}{2}bh$

$V = Bh$

2.5 cm

8 cm

12 cm

24 Find the volume of the rectangular pyramid. State the area of the base and the volume.

$A = l \cdot w$

$V = \dfrac{1}{3}Bh$

6 yd

21 yd

7 yd

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25 Find the value of the trigonometric ratios and to the nearest ten-thousandth.

$\sin 25.2°$

> ⓘ Answer should be a decimal rounded to the nearest ten-thousandth. Ex: 0.1234

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26 *Solve the system using Cramer's Rule and enter the values of the variables below.*

$Remember:$

$x = \dfrac{D_x}{D}$

$y = \dfrac{D_y}{D}$

$7x - 2y = 37$

$-5x - y = -24$

$D =$

$D_x =$

$D_y =$

$x =$

$y =$

---

28 Which rule describes a translation 3 units down?

Ⓐ $(x,\ y) \rightarrow (x,\ y + 3)$

Ⓑ $(x,\ y) \rightarrow (x + 3,\ y + 3)$

Ⓒ $(x,\ y) \rightarrow (x,\ y - 3)$

Ⓓ $(x,\ y) \rightarrow (x,\ -3y)$

29

Find the explicit and recursive rules for the given table

(a)

Month	n	1	2	3	4	5
Account balance ($)	f(n)	35	32	29	26	23

Part A

What is the recursive rule?

A $f(n) = f(n-1) + 3, \ f(1) = 35$

B $f(n) = f(n-1) - 3, \ f(1) = 35$

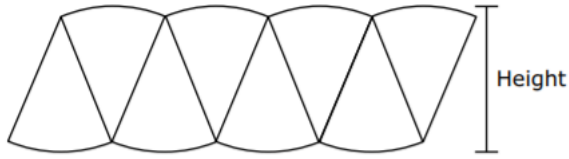C $f(n) = 35 + 3(n-1)$

D $f(n) = 38 - 3n$

(b)

Part B

What is the explicit rule?

A $f(n) = f(n-1) + 3, \ f(n) = 35$

B $f(n) = f(n-1) - 3, \ f(1) = 35$

C $f(n) = 35 + 3(n-1)$

D $f(n) = 38 - 3n$

32 **What vector will move the point $(3, -7)$ to $(2, 1)$?**

A	$< 4, 3 >$

B	$< -2, 6 >$

C	$< 9, -2 >$

D	$< -1, 8 >$

33 Alejandro cut a circle with circumference C and radius r into 8 congruent sectors and used them to make the figure shown.

Alejandro noticed that the figure was very close to the shape of a parallelogram.
Select all the statements that apply to the figure.

A The height of the parallelogram is approximately equal to the circle's diameter.

B The area of the parallelogram is approximately $\frac{1}{2}Cr$.

C The length of the parallelogram is approximately equal to the circle's circumference.

D The radius of the circle is approximately equal to the height of the parallelogram.

E The area of the parallelogram is approximately $8\left(\dfrac{45}{360}\pi r^2\right)$.

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34 Find the unit vector, u, in the direction of the given vector w.
$w = 3i + 3j$

u=

**35** Given the vector $\mathbf{v} =< 2, -4 >$, find the image of the line $2x - 3y = 6$ under the translation map $T_\mathbf{v}$.

(A) $2x - 3y = 22$

(B) $2x - 3y = -10$

(C) $2x - 3y = 8$

(D) $2x - 3y = 4$

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37 Multiply the following matrices given in the first column to find the missing term and choose the appropriate result.

Matrices	0	15	2
$\begin{bmatrix} -1 & 2 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} 3 & 2 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ ? & 10 \end{bmatrix}$	○	○	○
$\begin{bmatrix} 3 & 1 \\ 0 & 0 \end{bmatrix}\begin{bmatrix} 3 & -2 \\ -3 & 2 \end{bmatrix} = \begin{bmatrix} 6 & -4 \\ 0 & ? \end{bmatrix}$	○	○	○
$\begin{bmatrix} 0 & 0 \\ 0 & 1 \end{bmatrix}\begin{bmatrix} -1 & 2 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ ? & 1 \end{bmatrix}$	○	○	○

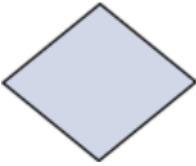**38** A cube is sliced as shown.
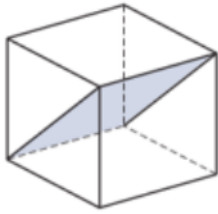
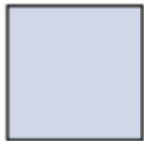What is the shape of the cross section?

(A) Rectangle

(B) Rhombus
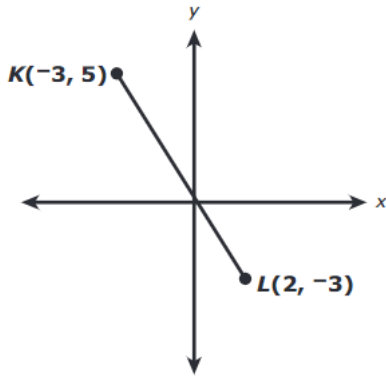

(C) Square

(D) Trapezoid

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39 Change $\left(5, \dfrac{\pi}{10}\right)$ from polar to rectangular coordinates.

Round your answer to nearest thousandths.

In (x, y) form, the rectangular coordinates are: (_____ , _____)
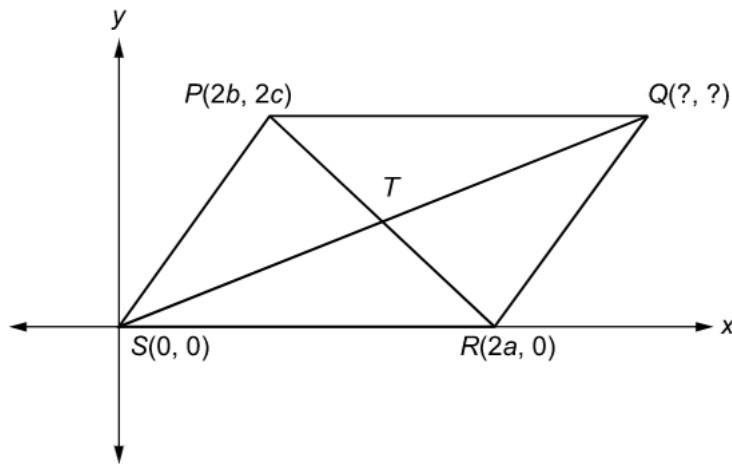
40 Line segment KL is shown on this coordinate plane.

What are the coordinates of the midpoint of line segment KL?

Ⓐ $\left(-1, \dfrac{1}{2}\right)$

Ⓑ $\left(-\dfrac{1}{2}, 1\right)$

Ⓒ $\left(\dfrac{1}{2}, -1\right)$

Ⓓ $\left(1, -\dfrac{1}{2}\right)$

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41 The figure shows parallelogram $PQRS$ on a coordinate plane.
Diagonals $\overline{SQ}$ and $\overline{PR}$ intersect at point T.

(a)

Part A

Find the coordinates of point Q in terms of a, b, and c.

Enter your answer in the box provided. Enter only your answer.

(b)

Since $PQRS$ is a parallelogram , $\overline{SQ}$ and $\overline{PR}$ bisect each other. Use the coordinates to verify that $\overline{SQ}$ and $\overline{PR}$ bisect each other. Enter your justification in the box provided.

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42 $\triangle RSV$ has coordinates $R(2,\ 1)$, $S(3,\ 2)$, and $V(2,\ 6)$. A translation maps point R to R' at $(-4,\ 8)$. What are the coordinates for S' for this translation?

- (A) (-6, -4)
- (B) (-3, 2)
- (C) (-3, 9)
- (D) (-4, 13)

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43 Trapezoid $RSTU$ is shown on the coordinate grid below.
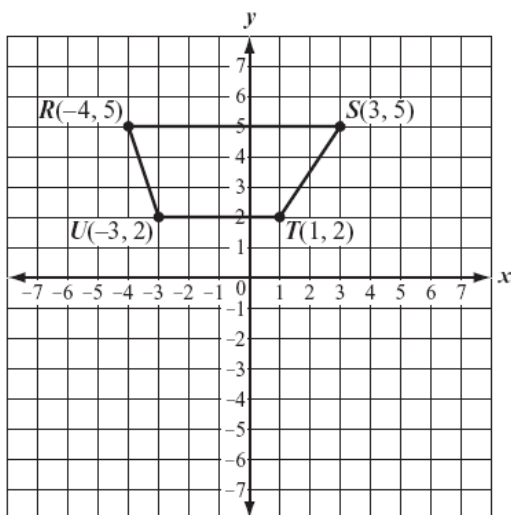
Trapezoid $RSTU$ will be reflected over the x-axis to create trapezoid $R'S'T'U'$. What will be the coordinates of point R', the image of point R after the reflection?

- (A) $(4,5)$
- (B) $(4,-5)$
- (C) $(-4,5)$
- (D) $(-4,-5)$

44 Triangle MNP is graphed on a coordinate grid with vertices at $M\,(-3,-6),\ N\,(0,3)$ and $P\,(6,-3)$. Triangle MNP is dilated by a scale factor of u with the origin as the center of dilation to create triangle $M'N'P'$. Which ordered pair represents the coordinates of the vertex P'?

(A) $(6+u,-3+u)$

(B) $\left(\dfrac{6}{u},-\dfrac{3}{u}\right)$

(C) $\left(6+\dfrac{1}{u},\ -3+\dfrac{1}{u}\right)$

(D) $(6u,-3u)$

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47 Match the name of conic section with the conic in general form

Circle	◯━◯	⌐ - - - - - - - - - - - - ¬
Ellipse	◯━◯	⌐ - - - - - - - - - - - - ¬
Hyperbola	◯━◯	⌐ - - - - - - - - - - - - ¬
Parabola	◯━◯	⌐ - - - - - - - - - - - - ¬

DRAG & DROP THE ANSWER

$-2x^2+20x+y-49=0$

$-x^2+y^2-6x-2y-12=0$

$x^2+y^2+8x-8y+31=0$

$4x^2+y^2-24x-4=0$

48 Use the discriminant to classify each conic section.

Part A

$4x^2 + 4y^2 - 28x + 24y + 61 = 0$ Discriminant = [   ]   Conic: [a   ⌄]

Part B

$25x^2 - y^2 - 200x + 375 = 0$

Discriminant = [   ]   Conic: [b   ⌄]

Part C

$49x^2 + 9y^2 - 294x = 0$

Discriminant = [   ]   Conic: [c   ⌄]

a
- ○ Parabola
- ○ Ellipse
- ○ Circle
- ○ Hyperbola

b
- ○ Parabola
- ○ Ellipse
- ○ Circle
- ○ Hyperbola

c
- ○ Parabola
- ○ Ellipse
- ○ Circle
- ○ Hyperbola

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49 Which equation matches the graph
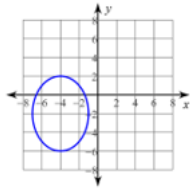
(A) $\dfrac{(x-4)^2}{9} + \dfrac{(y-2)^2}{16} = 1$

(B) $\dfrac{(x+4)^2}{9} + \dfrac{(y+2)^2}{16} = 1$

(C) $\dfrac{(x+4)^2}{9} + \dfrac{(y-2)^2}{16} = 1$

50

Match each equation with the appropriate name. (Drag each equation to the corresponding box)

$$(x-2)^2 = \frac{1}{2}(y+3)$$

$$\frac{(x-2)^2}{25} + \frac{(y+3)^2}{49} = 1$$

$$\frac{(x-2)^2}{25} - \frac{(y+3)^2}{49} = 1$$

$$(x-2)^2 + (y+3)^2 = 16$$

Parabola

Ellipse

Circle

Hyperbola

51

Match each characteristic with the appropriate equation. Check all that apply.

	Vertex is (h,k)	Center is (h,k)	$a > b$	$c^2 = a^2 - b^2$	$c^2 = a^2 + b^2$
Parabola	☐	☐	☐	☐	☐
Ellipse	☐	☐	☐	☐	☐
Circle	☐	☐	☐	☐	☐
Hyperbola	☐	☐	☐	☐	☐

52

Choose whether the definition belongs to an ellipse, hyperbola, or both (if both, then select both). Then choose if the definition matches the value of a, b, or, c.

	Ellipse	Hyperbola	a	b	c
The distance between the center and a vertex.	☐	☐	☐	☐	☐
Half the length of the Conjugate Axis.	☐	☐	☐	☐	☐
The distance between the center and a foci.	☐	☐	☐	☐	☐
Half the length of the Transverse Axis.	☐	☐	☐	☐	☐
Half the lenghth of the Minor Axis.	☐	☐	☐	☐	☐
The distance between the center and a co-vertex.	☐	☐	☐	☐	☐
Half the length of the Major Axis.	☐	☐	☐	☐	☐

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54 Write the equation of the parabola in standard form with the given characteristics.

Focus: (6,-5)

Directrix: x = 14

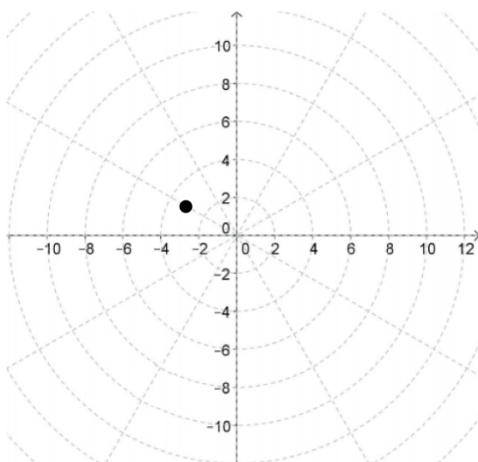**57** Convert $-6 + 6i\sqrt{3}$ to polar form.

(A) $6\sqrt{2}\left(\cos 120° + i\sin 120°\right)$

(B) $6\sqrt{2}\left(\cos 300° + i\sin 300°\right)$

(C) $12\left(\cos 120° + i\sin 120°\right)$

(D) $12\left(\cos 300° + i\sin 300°\right)$

(E) $144\left(\cos 120° + i\sin 120°\right)$

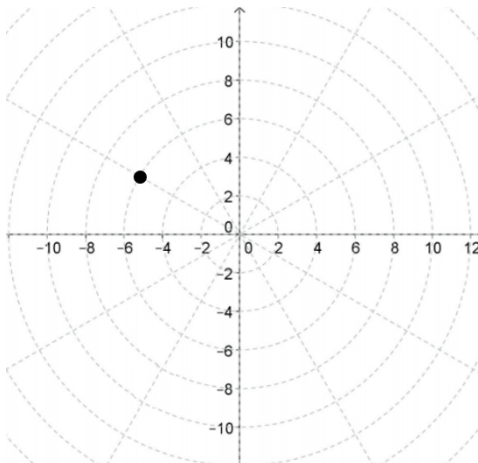(F) $144\left(\cos 300° + i\sin 300°\right)$

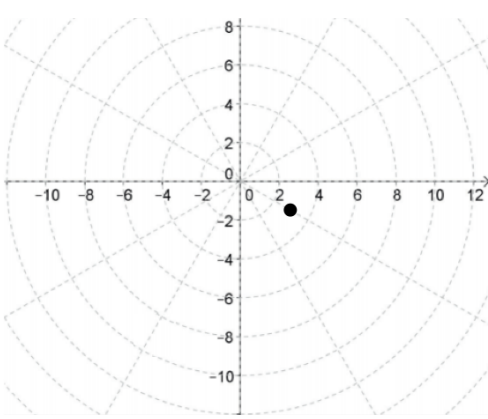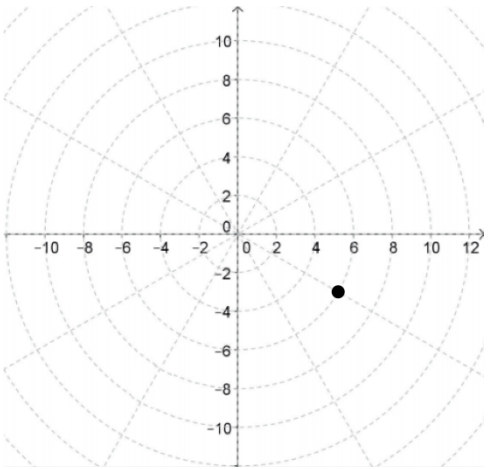**58** Which of the following shows the complex number $-3\sqrt{3} + 3i$ on the polar grid?
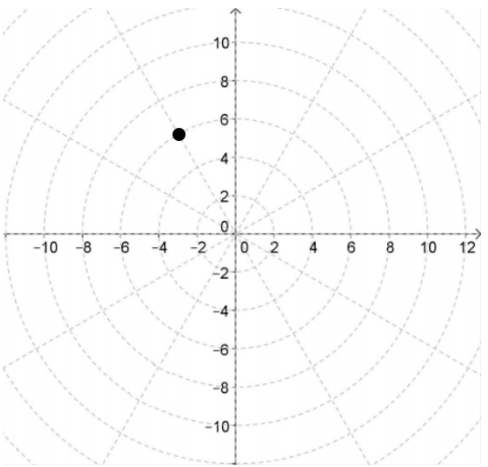
(A)

(B)

(C)
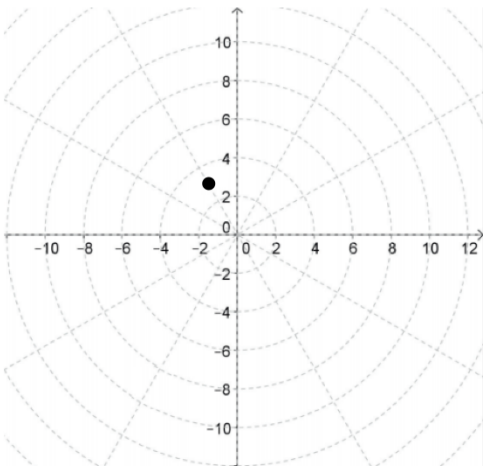
59 Which polar coordinate is equivalent to $\left(3, \dfrac{5\pi}{6}\right)$

(A) $\left(3, \dfrac{11\pi}{6}\right)$

(B) $\left(-3, \dfrac{11\pi}{6}\right)$

(C) $\left(3, -\dfrac{5\pi}{6}\right)$

(D) $\left(-3, \dfrac{17\pi}{6}\right)$

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63 What is the polar form of the complex number $-4 - 4\sqrt{3}i$?

(A) $64\left(\cos\left(\dfrac{\pi}{3}\right) + i\sin\left(\dfrac{\pi}{3}\right)\right)$

(B) $8\left(\cos\left(\dfrac{4\pi}{3}\right) + i\sin\left(\dfrac{4\pi}{3}\right)\right)$

(C) $64\left(\cos\left(\dfrac{4\pi}{3}\right) + i\sin\left(\dfrac{4\pi}{3}\right)\right)$

(D) $8\left(\cos\left(\dfrac{\pi}{3}\right) + i\sin\left(\dfrac{\pi}{3}\right)\right)$

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64 Change (-2, 4) into polar coordinates

(A) $(4.5, 63.4°)$

(B) $(4.5, 116.6°)$

(C) $(4.5, 243.4°)$

(D) $(4.5, 296.6°)$

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65 Match each with the correct sum or difference

| (2 + i) + (-3 + 3i) | ●━━● | ⌐ - - - - - - - ¬ |

| (5 + i) + (5 - i) | ●━━● | ⌐ - - - - - - - ¬ |

| (-6 - 2i) - (4 + 2i) | ●━━● | ⌐ - - - - - - - ¬ |

DRAG & DROP THE ANSWER
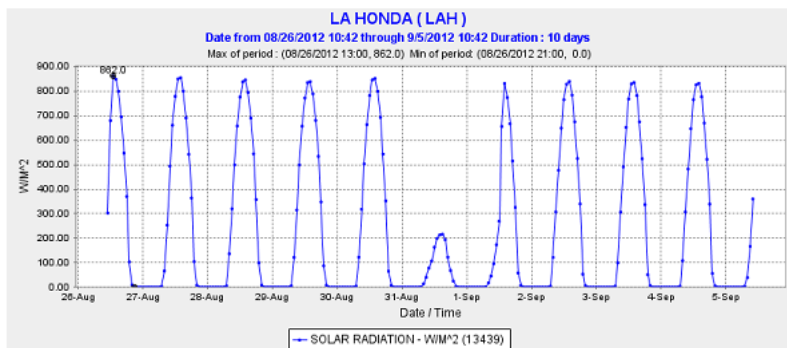
10

-10 - 4i

-1 + 4i

66 Find the product: (5 - 7i)(-4 - 3i)

The following graph shows the solar radiation over a period of time in La Honda, CA. Solar radiation is the amount of the sun's rays that reach the Earth's surface.

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67 (Lesson 5)
On August 31, there is a low peak. What do you think is happening on that day for the peak to be lower than the others?

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70 Probabilities for two events, event A and event B, are given.

$P(A \text{ and } B) = 0.14$
$P(B) = 0.4$

What is the probability of A given B?

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71 At Kennedy Middle School, the probability that a student takes Technology and Spanish is 0.087. The probability that a student takes Technology is 0.68. What is the probability that a student takes Spanish given that the student is taking Technology?
Type your result in the empty box provided below in decimal form rounded to the hundredth place.

Answer: [   ]

72 Describe the shape of the distribution shown in the dot plot.

The dot plot displays the golf scores from a golf tournament.

golf score (strokes)
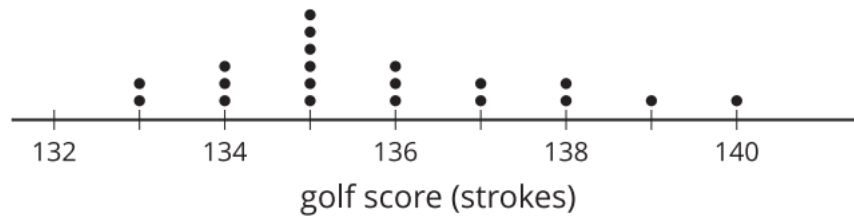
(A) Uniform

(B) Bimodal

(C) Left-Skewed

(D) Right-Skewed

(E) Symmetrical

(F) Bell-shaped

---

73 The probability distribution for x is presented in the following table. What is the expected value of the random variable x?

x	2	3	4	5
P	.45	.15	.3	.1

(A) 3.66

(B) 3.05

(C) 1.55

(D) 2.45

74 Describe the shape of the distribution shown in the histogram which displays the light output, in lumens, of various light sources.

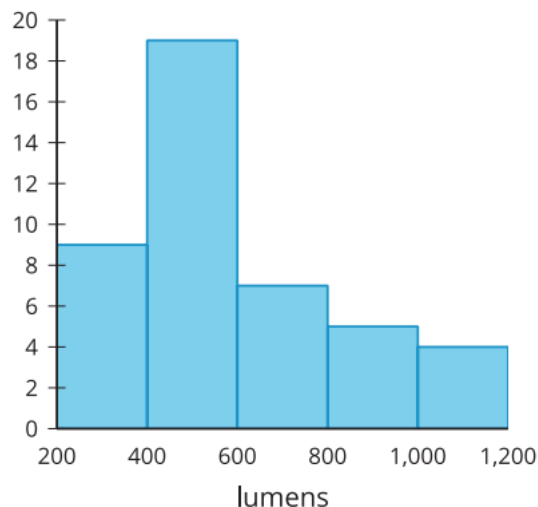A Skewed right with a center near 600 lumens.

B Skewed right with a center near 200 lumens.

C Skewed right with a center near 1000 lumens.

D Skewed left with a center near 600 lumens.

E Skewed left with a center near 200 lumens.

F Skewed left with a center near 800 lumens.

---

75 This histogram shows the frequency distribution of duration times for 107 consecutive eruptions of the Old Faithful geyser. The duration of an eruption is the length of time, in minutes, from the beginning of the spewing of water until it stops. What is the BEST description for the distribution?
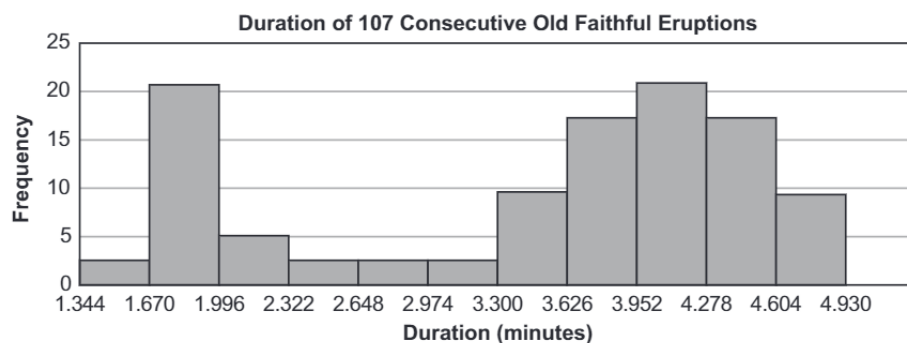
A bimodal

B uniform

C multiple outlier

D skewed to the right

76 The box-and-whisker plot below shows the distribution of student scores on a history test.

History Test Scores


```
56 60 64 68 72 76 80 84 88 92 96 100
```
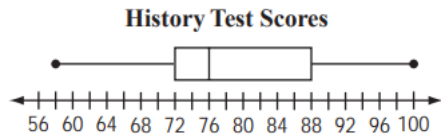
Based on the box-and-whisker plot, what is the median history test score?
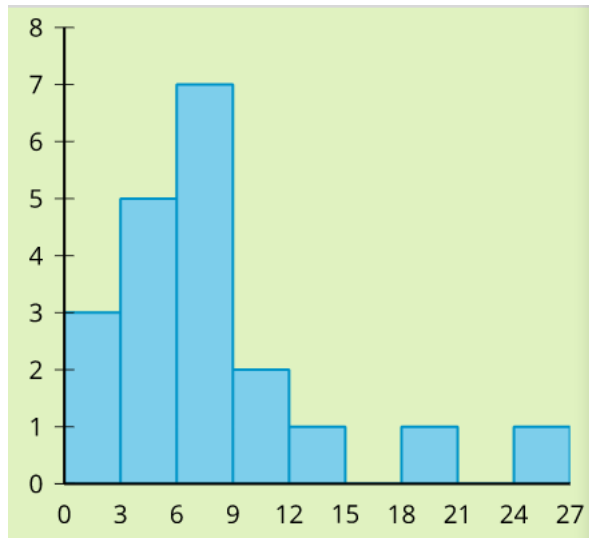
Ⓐ 72

Ⓑ 76

Ⓒ 80

Ⓓ 88

77

(a)

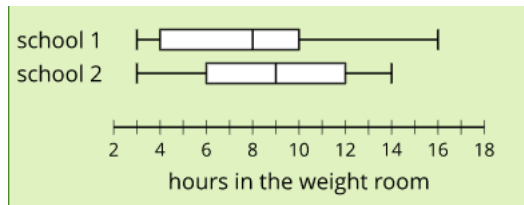Describe the shape of the distribution.

Ⓐ Skewed Left

Ⓑ Skewed Right

Ⓒ Normal

Ⓓ Bimodal

Ⓔ Uniform

(c)

78 The two box plots summarize the number of hours spent in the weight room for all the players on the football team for two different high schools.

Which of the statements must be true about the distribution of data represented in the boxplots?

(A) Players at school 1 typically spent more time in the weight room than players at school 2.

(B) The middle half of the data for school 1 has more variability than the middle half of the data for school 2.

(C) The median hours spent in the weight room for school 1 is less than the median for school 2 and the interquartile ranges for both schools are equal.

(D) The total number of hours spent in the weight room for players at school 2 is greater than the total number of hours for players at school 1.

---

79 The scores of a recent test taken by 1200 students had an approximately normal distribution with a mean of 225 and a standard deviation of 18. Determine the number of students who scored between 200 and 245.

---

81 The weight of a bag of pears at the local market averages 8 pounds with a standard deviation of 0.5 pound. The weights of all the bags of pears at the market closely follow a normal distribution. Determine what percentage of bags, to the *nearest integer*, weighed less than 8.25 pounds.

---

82 Which of the following is guaranteed by the central limit theorem?

(A) When a sample size is large enough, the mean of the sampling distribution is equal to the mean of the population.

(B) When a sample size is large enough, the shape of the sampling distribution is approximately normal, regardless of the shape of the population's distribution.

(C) When a sample size is large enough, the standard deviation of the sampling distribution is equal to the standard deviation of the population divided by the sample size.

(D) All of the above statements are true.

---

83 A circle with center L contains points J and K. Circle L is dilated by a factor of 2, resulting in a new circle with center P. Points M and N are on circle P such that central angle MPN has the same measure as central angle JLK.

Which statement correctly identifies the relationship between the arc length of JK and the arc length of MN?

(A) The arc length of JK is half the arc length of MN.

(B) The arc length of MN is half the arc length of JK.

(C) The arc length of JK is a quarter of the arc length of MN.

(D) The arc length of MN is a quarter of the arc length of JK.

84 **What vector will move $\triangle ABC$ to $\triangle A'B'C'$?**

A	$< -3, -6 >$

B	$< 3, 6 >$

C	$< 6, -3 >$

D	$< -6, -3 >$

---
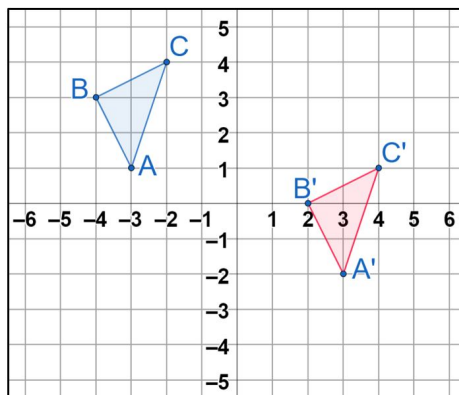
85 The top of a door is to be decorated with stained glass panes that are arranged in a semicircular shape as shown below.
The radius of the semicircular shape is 1 meter and its outside edge is trimmed with metal cord.

The red and blue sectors are trimmed with gold cord and the yellow and green sectors are trimmed with silver cord, as shown in the diagram below.
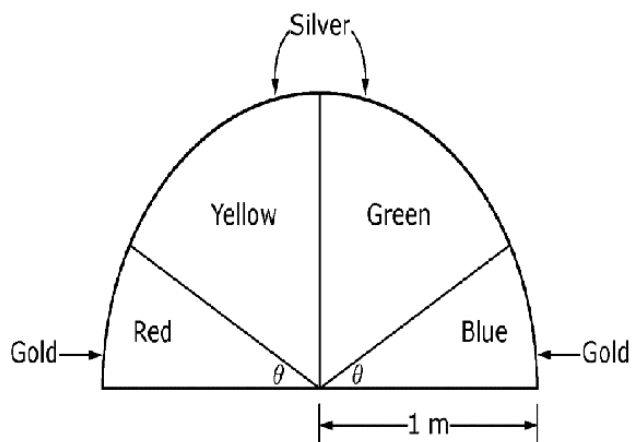
If the angle θ in the red and blue sectors measures 0.5 radians, what length of silver cord is needed?
Mark all that apply.

A	$\pi - 1$ meters

B	2.14 meters

C	$\pi + 1$ meters

D	2.01 meters

86 Consider the function $f(x) = x^2 - 3x - 10$. The function has been rewritten in the different form. Which of the forms most clearly reveals the coordinates of the vertex of the function?

(A) $(x - 5)(x + 2)$, with vertex at $(5, -2)$

(B) $(x - 5)(x + 2)$, with vertex at $(-5, -2)$

(C) $\left(x - \dfrac{3}{2}\right)^2 - \dfrac{49}{4}$, with vertex at $\left(-\dfrac{3}{2}, -\dfrac{49}{4}\right)$

(D) $\left(x - \dfrac{3}{2}\right)^2 - \dfrac{49}{4}$, with vertex at $\left(\dfrac{3}{2}, -\dfrac{49}{4}\right)$

---

87 Which is the conic standard form of the equation $4x^2 - 5y^2 - 16x - 30y - 9 = 0$?

(A) $\dfrac{(x-4)^2}{11} + \dfrac{(y-3)^2}{4} = 1$

(B) $\dfrac{(x-4)^2}{11} - \dfrac{(y-3)^2}{4} = 1$

(C) $\dfrac{(y+3)^2}{4} - \dfrac{(x-2)^2}{5} = 1$

(D) $\dfrac{(y-3)^2}{6} - \dfrac{(x-2)^2}{9} = 1$

(E) None of these answers are correct.

---

88 Which equation represents a parabola with a focus of $(0, 4)$ and a directrix of $y = 2$?

(A) $y = x^2 + 3$

(B) $y = -x^2 + 1$

(C) $y = \dfrac{x^2}{2} + 3$

(D) $y = \dfrac{x^2}{4} + 3$

---

89 Classify the conic section and then write it in standard form.
$x^2 + y^2 + 8x - 4y + 19 = 0$

(a) Classify the conic section [a ⌄]

Write the conic section in standard from

a
- ○ Circle
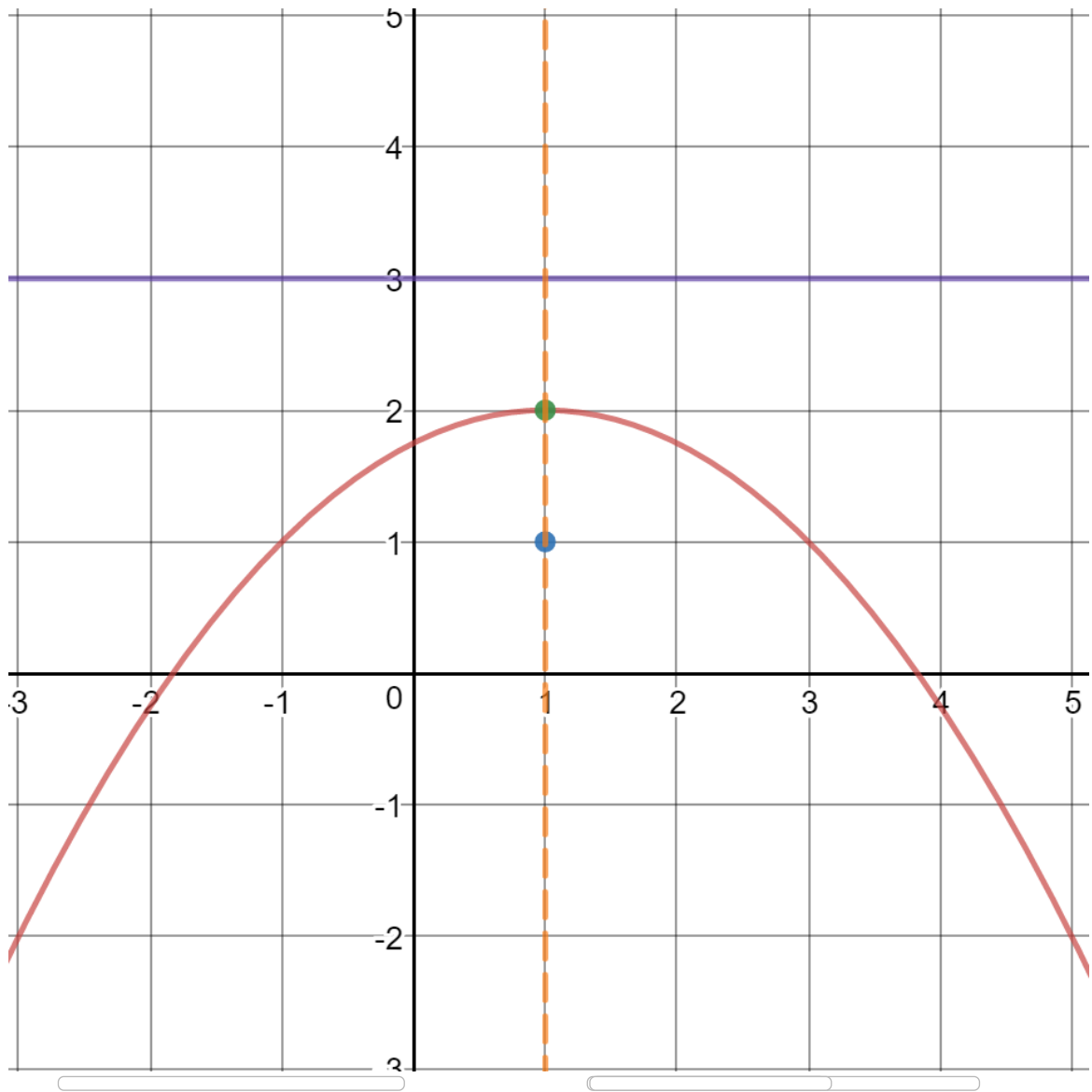- ○ Ellipse
- ○ Hyperbola
- ○ Parabola

(b)

(A) $(x + 4)^2 + (y - 2)^2 = 1$

(B) $(x + 4)^2 - (y - 2)^2 = 1$

(C) $(x + 4)^2 + (y - 2)^2 = 9$

90 Label the vertex, focus, axis of symmetry, and directrix.

DRAG & DROP THE ANSWER

Vertex (1,2)

Vertex (1,1)

Focus (1,2)

Focus (1,1)

Axis of Symmetry: x = 1

Axis of Symmetry: y = 1

Directrix: y = 3

Directrix: x = 3

91 Classify the conic section $4x^2 + 7y^2 + 16x + 56y + 100 = 0$ as an ellipse or a hyperbola. Give the coordinates of the center and foci.

(A) hyperbola; center $(-2, 4)$; foci$(-4, -2 \pm \sqrt{3})$

(B) hyperbola; center $(2, -4)$; foci$(-2, -4 \pm \sqrt{3})$

(C) ellipse; center $(2, 4)$; foci$(-4 \pm \sqrt{3}, -2)$

(D) ellipse; center $(-2, -4)$; foci$(-2 \pm \sqrt{3}, -4)$

---

92 What type of conic section is the given equation? $\dfrac{(x+2)^2}{25} - \dfrac{y^2}{16} = 1$

(A) circle

(B) parabola

(C) ellipse

(D) hyperbola

---

93 Re-Write the Conic section into standard form: $9y^2 - x^2 + 54y - 6x - 270 = 0$

---

94 Select all the characteristics below that apply to the ellipse. (4 items should be selected below)
$\dfrac{(x+2)^2}{25} + \dfrac{(y+2)^2}{9} = 1$

A Center (2,2)

B Center (-2,-2)

C Direction of Opening: Horizontally

D Direction of Opening: Vertically

E Major Axis Length: 10 units

F Major Axis Length: 25 units

G Minor Axis Length: 9 units

H Minor Axis Length 6 units

96 Which is the equation for an **ellipse** with **vertices (–3, 4), (11, 4)** and **foci (–1, 4), (9, 4) ?**

(A) $\dfrac{(x-4)^2}{49} + \dfrac{(y-4)^2}{24} = 1$

(B) $\dfrac{(x-4)^2}{49} + \dfrac{(y-4)^2}{25} = 1$

(C) $\dfrac{x-2}{7} + \dfrac{y^2}{5} = 1$

(D) $\dfrac{(x-4)^2}{24} + \dfrac{(y-4)^2}{49} = 1$

---

97 Match the coordinates given in the first column with their corresponding location, using the following translation rule.

$(x,\ y) \rightarrow (x-6,\ y+3),$

(3, 5)	●—●
(−2, −1)	●—●
(7, 2)	●—●
(9, −3)	●—●

DRAG & DROP THE ANSWER

(−8, 2)

(3, 0)

(−3, 8)

(1, 5)

---

98 (Continues from last question) Diego arranges the students in his math class from shortest to tallest and measures the height in inches of each student in the class. The heights of the 22 shortest students are summarized in the histogram.

(a) The tallest 8 students have their heights recorded here.

73 73 73 75 75 77 79 81

Use the shape of the distribution to compare the mean and median.

Are the mean and median equal?

(A) Yes, mean and median are equal

(B) No, mean is greater than the median.

(C) No, median is greater than the mean.

(b) Explain your reasoning using the histogram as evidence.