

SGM Review #2

1. What is the product of $\begin{bmatrix} -2 & 3 \\ 1 & -4 \end{bmatrix} \begin{bmatrix} 0 & 2 \\ 3 & -6 \end{bmatrix}$
- A. $\begin{bmatrix} 6 & -8 \\ -24 & 27 \end{bmatrix}$ B. $\begin{bmatrix} 8 & -12 \\ 2 & 26 \end{bmatrix}$ C. $\begin{bmatrix} 9 & 22 \\ 12 & 26 \end{bmatrix}$ D. $\begin{bmatrix} 9 & -22 \\ -12 & 26 \end{bmatrix}$

2. Which matrix would you multiply by in order to solve the equation $\begin{bmatrix} -1 & 4 \\ 2 & -7 \end{bmatrix} X = \begin{bmatrix} 5 & -8 \\ 2 & 1 \end{bmatrix}$ FIND $A^{-1} \cdot B$
- A. $\begin{bmatrix} -5 & -2 \\ 1 & -\frac{1}{7} \end{bmatrix}$ B. $\begin{bmatrix} 7 & 4 \\ 2 & 1 \end{bmatrix}$ C. $\begin{bmatrix} 43 & -52 \\ 12 & -15 \end{bmatrix}$ D. $\begin{bmatrix} -43 & 52 \\ -12 & 15 \end{bmatrix}$

3. What is the value of $\begin{vmatrix} 11 & 8 \\ -12 & 6 \end{vmatrix}$? $(6)(11) - (-12)(8)$
 $66 + 96$

- A. 162 B. -30 C. 30 D. -162

4. What is the value of w that makes the statement at right true?

- A. 5 B. -5 C. 3 D. $-\frac{3}{2}$

$$\begin{vmatrix} 8 & w \\ 6 & -2 \end{vmatrix} = 2w - 4$$

$$(8)(-2) - (6)(w) = 2w - 4$$

$$-16 - 6w = 2w - 4$$

$$-16 = 8w - 4$$

$$-12 = 8w$$

$$-12 = w$$

$$\frac{-3}{8} \text{ OR } w = -\frac{3}{2}$$

5. What are the foci of the ellipse with equation $2x^2 + y^2 = 10$?

- A. $(\pm\sqrt{15}, 0)$ B. $(0, \pm\sqrt{15})$ C. $(\pm\sqrt{5}, 0)$ D. $(0, \pm\sqrt{5})$

- $\text{Center } (0, -4)$

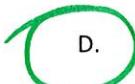
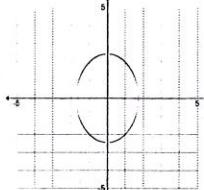
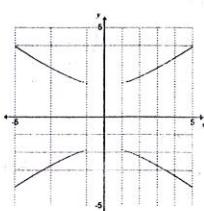
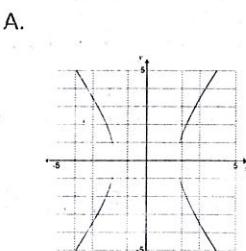
~~horizontal~~ ~~vertical~~ $\therefore a=5$

6. Find the vertices of the hyperbola with equation $\frac{(x-3)^2}{25} - \frac{(y+4)^2}{4} = 1$

- A. $(8, -4), (-2, -4)$ B. $(5, -4), (1, -4)$ C. $(3, -2), (3, -6)$ D. $(3, 1), (3, -9)$

$\text{Center } (3, -4)$

7. Which graph best represents the graph of $6y^2 + 3x^2 = 18$?



$$\frac{6y^2}{18} + \frac{3x^2}{18} = \frac{18}{18}$$

$$\rightarrow \frac{y^2}{3} + \frac{x^2}{6} = 1$$

\rightarrow ellipse, horizontal

8. Which equation best represents the graph at right?

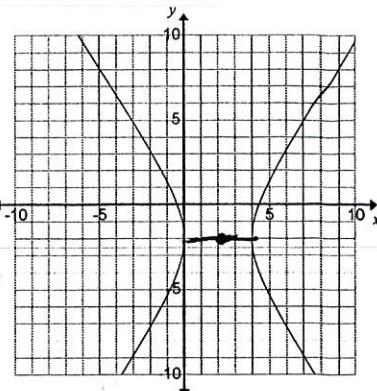
A. $\frac{(x-2)^2}{4} - \frac{(y+2)^2}{9} = 1$

B. $\frac{(x+2)^2}{4} - \frac{(y-2)^2}{9} = 1$

~~C. $\frac{(y+2)^2}{9} - \frac{(x-2)^2}{4} = 1$~~

~~D. $\frac{(y+2)^2}{4} - \frac{(x-2)^2}{9} = 1$~~

Curves open left/right ∵
 x^2 is lead (positive) term
 $a = 2$ ∵
4 is denominator for x^2



9. Let θ be an angle in standard position. Given $\tan \theta > 0$ and $\sin \theta < 0$, name the quadrant in which θ lies.

A. Quadrant I

B. quadrant II

C. quadrant III

D. quadrant IV



10. Find the reference angle for $\frac{2\pi}{3}$.

A. $\frac{\pi}{3}$

B. $\frac{4\pi}{3}$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{6}$

NEVER, NEVER, NEVER NEGATIVE!

11. The amplitude of the graph of $y = -2\cos 3x$ is what value?

A. 2

B. -2

C. 3

D. -3

$$2x + \pi = 0$$

$$2x = -\pi$$

$$x = -\frac{\pi}{2}$$

D. $\frac{\pi}{2}$ left

12. What is the phase shift of the graph of $y = 4\sin(2x + \pi)$?

A. π left

B. π right

C. 2π right

$$2x + \pi = 0$$

$$2x = -\pi$$

$$x = -\frac{\pi}{2}$$

D. $\frac{\pi}{2}$ left

13. In the interval $0 \leq x \leq 2\pi$, the solutions of the equation $\sin^2 x = \sin x$ are GCF!

A. $0, \frac{\pi}{2}, \pi$

B. $\frac{\pi}{2}, \frac{3\pi}{2}$

C. $0, \frac{\pi}{2}, \frac{3\pi}{2}$

D. $\frac{\pi}{2}, \pi, \frac{3\pi}{2}$

$$\sin^2 x = \sin x$$

$$\sin^2 x - \sin x = 0$$

$$\sin x(\sin x - 1) = 0$$

$$\sin x = 0 \quad \sin x - 1 = 0$$

$$\sin^{-1}(0) \quad \sin x = 1$$

$$0^\circ, \pi \quad \sin^{-1}(1)$$

$$\text{and } \left[\frac{\pi}{2} \right]$$

14. What is the solution set for $2\cos \theta - 1 = 0$ in the interval $0^\circ \leq \theta < 360^\circ$?

A. $(30^\circ, 150^\circ)$

B. $(60^\circ, 120^\circ)$

C. $(30^\circ, 330^\circ)$

D. $(60^\circ, 300^\circ)$

$$2\cos \theta = 1$$

$$\cos \theta = \frac{1}{2}$$

$$\cos^{-1}\left(\frac{1}{2}\right) = 60^\circ$$

Name every angle on unit circle where $\cos \theta = \frac{1}{2}$



15. What is a value of $\text{Arc sin}\left(-\frac{\sqrt{2}}{2}\right)$?

A. $\frac{\pi}{4}$

B. $-\frac{\pi}{4}$

C. $\frac{\pi}{2}$

D. $-\frac{\pi}{2}$

use your calculator

16. The value of $\cos(\arctan \sqrt{3})$ is

A. 1

B. $\frac{1}{2}$

C. $\frac{\sqrt{3}}{2}$

D. $\frac{\sqrt{2}}{2}$

17. Al is standing 50 yards from a maple tree and 30 yards from an oak tree in the park. His position is shown in the accompanying diagram. If he is looking at the maple tree, he needs to turn his head 120° to look at the oak tree.

use Law of Cosines

How far apart are the trees?

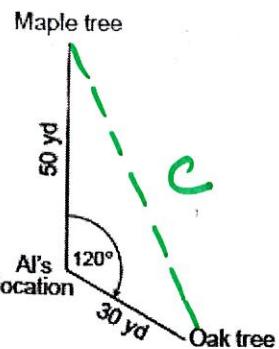
A. 58.3 ft

B. 65.2 ft

C. 70 ft

D. 75 ft

$$c^2 = 50^2 + 30^2 - 2(50)(30)\cos 120^\circ$$



18. In $\triangle ABC$, $m\angle A = 33$, $a = 12$, and $b = 15$. What is $m\angle B$ to the nearest degree?

41

B. 43

C. 44

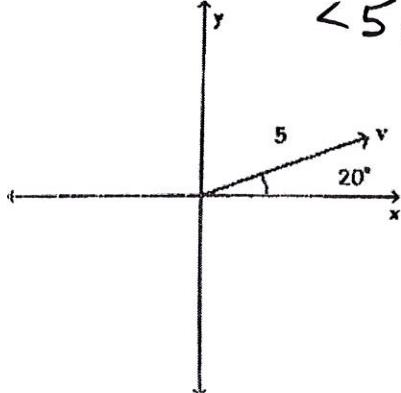
D. 48

$$c = \sqrt{50^2 + 30^2 - 2(50)(30)\cos 120^\circ}$$

Law of Sines

19. Find the component form of the vector \vec{v} .

Draw a picture + label



A) $\approx (4.70, 1.82)$

B) $\approx (1.71, 4.70)$

C) $\approx (0.94, 0.34)$

D) $\approx (4.70, 1.71)$

use \sin^{-1} on calculator

$$\frac{\sin 33^\circ}{12} = \frac{\sin B}{15}$$

$$\sin^{-1} \left(\frac{15 \sin 33^\circ}{12} \right) = \sin B$$

Given that $P = (-4, 5)$ and $Q = (-6, 4)$, find the component form and magnitude of the vector \vec{PQ} .

A) $\langle -10, -1 \rangle, \sqrt{101}$

B) $\langle 2, 1 \rangle, \sqrt{5}$

C) $\langle -2, -1 \rangle, 5$

D) $\langle -2, -1 \rangle, \sqrt{5}$

terminal point - initial point

$$\langle -6 - -4, 4 - 5 \rangle = \langle -2, -1 \rangle$$

$$\sqrt{2^2 + 1^2}$$

