★2026 FINAL EXAM REVIEW★

A2CP

Name:_____

Hour:_____

Final Exam Schedule			
Teacher	Hour	Date	Time
Shelson	2nd Hour	Monday, June 8th	9:45-11:15
Philliben	3rd Hour	Tuesday, June 9th	8:00-9:30
Barbour	5th Hour	Wednesday, June 10th	8:00-9:30
Barbour	6th Hour	Wednesday, June 10th	9:45-11:15

UNIT 4: RATIONAL EXPONENTS

1. [**MCQ**] Which expression is equivalent to $x^{\frac{5}{3}}$?

A. $\sqrt[5]{x^3}$ B. $\frac{x^5}{x^3}$ C. $\sqrt[3]{x^5}$ D. $\sqrt{x^5}$

***Simplify* the expression. Answers should include only *positive* exponents. You may leave your answer in rational exponent form when necessary.**

2. $(-3x^{-2}y)^2(7x^8y^{-2})$

3. $\frac{(27x^9)^{\frac{1}{3}}}{9x^5}$

4. $\left(\frac{x^{-\frac{1}{2}}y^3}{x^{-8}y}\right)^{-4}$

5. $\frac{7x^8y^3}{2z^{-\frac{1}{3}}} \cdot \frac{4z^{\frac{2}{3}}}{6x^{-5}y^{-7}}$

6. $4^{\frac{5}{2}} \cdot 81^{\frac{3}{4}}$

7. $(64x^{12})^{-\frac{1}{6}}$

8. [**MCQ**] Which expression is equivalent to $\left(\sqrt[4]{p^2}\right)^8$?

A. $p^{\frac{1}{2}}$
B. p
C. p^2
D. p^4

Solve the equation. Check for extraneous solutions.

9. $x^{\frac{3}{4}} = 27$

10. $2(x-5)^{\frac{5}{2}} = 64$

11. $\sqrt[3]{2x} + 4 = 2$

12. $-2\sqrt{4x-3} = -10$

13. $\sqrt[3]{5-x} = \sqrt[3]{3x+1}$

14. $x = \sqrt{36-5x}$

15. [**MCQ**] Solve the equation: $x + 3 = \sqrt{12x+1}$

A. -4

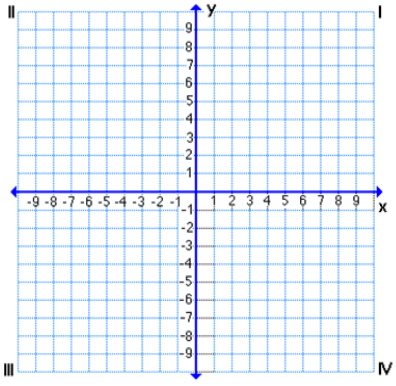
B. 2

C. $-2 \; and \; -4$

D. $2 \; and \; 4$

Graph the parent function that corresponds to $g(x)$. Then use transformations on the parent function to graph $g(x)$. Identify the domain and range of $g(x)$.

16. $g(x) = -2\sqrt{x} + 5$

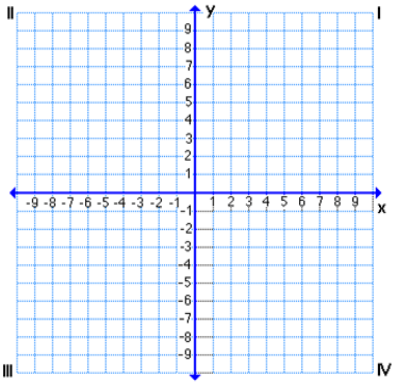


Transformations:

Domain:

Range:

17. $g(x) = \sqrt[3]{x-2} - 4$



Transformations:

Domain:

Range:

Unit 5: Exponential and Log Functions

Graph the EXPONENTIAL equation by graphing its parent function and then applying the given transformations.

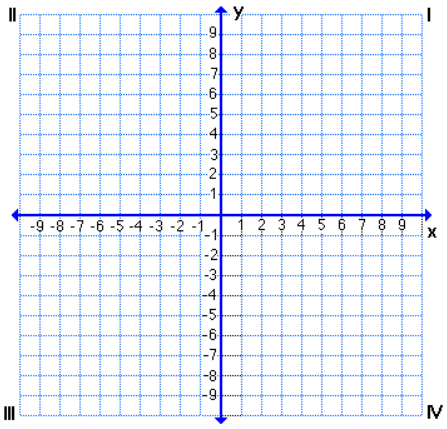
1. $f(x) = -\left(\frac{1}{2}\right)^{x-2} + 6$ Parent:

Transformations:

Asymptote:

Domain: Range:

End Behavior:



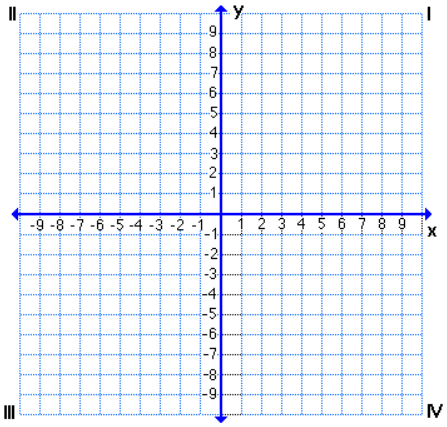
2. $f(x) = e^{x+5} - 3$ Parent:

Transformations:

Asymptote:

Domain: Range:

End Behavior:



3. [**MCQ**] What is the equation of the asymptote for the function $f(x) = -17 \cdot \left(\frac{1}{3}\right)^{x+18} + 34$?

A. $y = 34$ B. $y = -18$ C. $x = 34$ D. $x = -18$

Solve the exponential equation by using common bases.

4. $8^{x-4} = 128$

5. $25^{x} = 5\sqrt{5}$

6. $\left(\frac{1}{6}\right)^{3x-2} = 36^{2x}$

7. $64^{x-2} \cdot 16^{x+2} = \left(\frac{1}{4}\right)^{3x-1}$

Graph the LOGARITHMIC equation by graphing its parent function and then applying the given transformations.

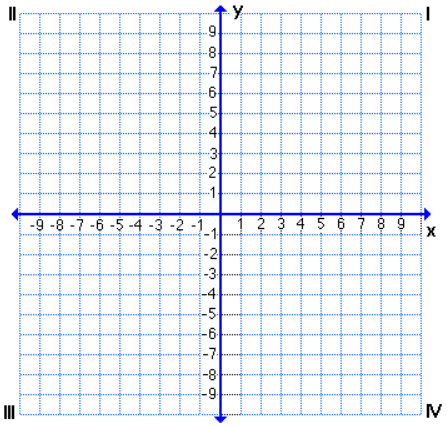
8. $f(x) = \log_2(x-3)+2$ Parent:

Transformations:

Asymptote:

Domain: Range:

End Behavior:



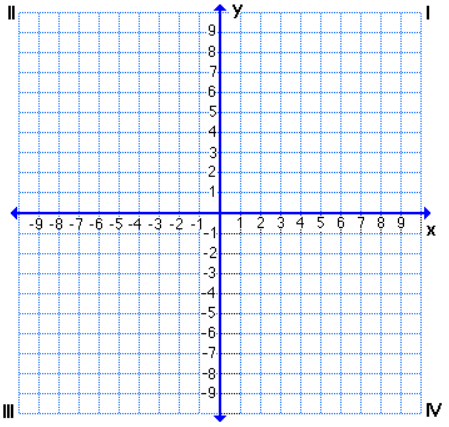
9. $f(x) = \ln(-x)-3$ Parent:

Transformations:

Asymptote:

Domain: Range:

End Behavior:



10. [**MCQ**] Which interval represents the **domain** of the function $g(x) = -\log_3(x+4)-2$?

A. $(-\infty, \infty)$ B. $(-\infty, -4)$ C. $(-4, \infty)$ D. $(0, \infty)$

11. [**MCQ**] Which of the following is equivalent to $\ln x = 8$?

A. $10^8 = x$
B. $e^8 = x$
C. $x^e = 8$
D. $e^x = 8$

Simplify the expression.

12. $\log_5 125$ **13.** $\log_{15} \frac{1}{15}$ **14.** $\log_{\frac{1}{8}} 64$ **15.** $\ln e^4$

16. $2\log_6 2 + \log_6 9$ **17.** $\frac{1}{3}\log_3 8 - \log_3 18$ **18.** $2\log_{12} 4 + \frac{1}{2}\log_{12} 81$

19. [**MCQ**] Let $f(x) = 3x + 2$ and $g(x) = \log_4 x$, evaluate $g(f(0))$.

A. 0 B. $\frac{1}{2}$ C. 2 D. Not possible

Find the <u>inverse</u> of the function.

20. $f(x) = \log(x - 2) + 5$

21. $g(x) = -3^x - 4$

Solve exponential equation. Round answers to the nearest hundredth when necessary.

22. $3^x = 29$

23. $6^{x-3} + 2 = 15$

24. $4e^{2x} = 48$

25. $9^x = 2^{x-1}$

Solve logarithmic equation. Round answers to the nearest hundredth when necessary. Remember to check for extraneous solutions!

26. $\log_3(2x) = 4$

27. $\log_5 x + \log_5(x - 4) = 1$

28. $\log_6(2 - x) = \log_6(x + 4)$

29. $\log(4x - 8) - \log 2 = 2$

30. A citrus orchard has 180 orange trees and the owner has discovered a fungus that is attacking her trees. Each month after, she finds that the number of living trees in her orchard decreases by one-third. How many living trees will there be after 6 months if nothing is done to stop the fungus from spreading?

31. Rentals in a high rise apartment building get more expensive higher up, since the views get better. The ground floor (floor 0) rent is $\$1{,}680$ and the rent increases by 4.7% per floor. On what floor is the rent $\$4{,}209.62$?

32. [**MCQ**] The function $N(t) = 1000(1.5)^{\frac{t}{6}}$ models the number of viral particles in a sample t hours after an initial measurement. How much time, in hours, does it take for the number of viral particles to increase by 50%?

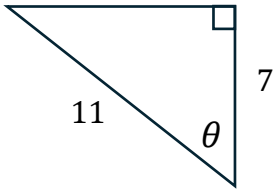
A. 3 hours
B. 6 hours
C. 9 hours
D. 12 hours

33. At 3% annual interest compounded monthly, how long would it take to double your initial investment of $\$1550$?

34. Jenn invests $\$2150$ at 2% compounded continuously. How many years will it take her to triple her initial investment?

Unit 6: Trigonometry

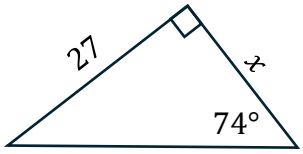
1. Find the indicated ratios for the triangle shown. Please leave answers exact and simplified.



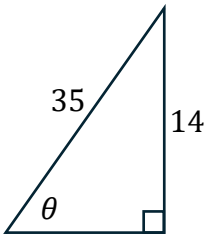
$\sin\theta =$ $\cot\theta =$

$\sec\theta =$ $\cos\theta =$

2. Find the length of side x to the nearest hundredth.



3. Find the measure of angle θ to the nearest tenth.



Use the given information to find the indicated ratios. Please leave answers exact and simplified.

4. $\cos\theta = -\frac{9}{41}$; θ falls in Q2

$\tan\theta =$

$\csc\theta =$

5. $\cot\theta = \frac{4}{3}$; $\sin\theta$ is negative

$\sin\theta =$

$\sec\theta =$

6. If the terminal ray of angle θ passes through the point $(7, -24)$, find the indicated ratios.

$\sin\theta =$

$\sec\theta =$

$\tan\theta =$

7. [**MCQ**] The degree measure of $\frac{5\pi}{3}$ is

A. $300°$ B. $60°$ C. $120°$ D. $120°$

8. [**MCQ**] The radian measure of $-1710°$ is

A. -1710π B. $-\frac{\pi}{2}$ C. $-\frac{19\pi}{2}$ D. $-\pi$

9. [**MCQ**] Which of the following is NOT a **coterminal** angle for $225°$?

A. $405°$ B. $585°$ C. $-135°$ D. $-495°$

10. [**MCQ**] What is the **reference** angle for $\frac{7\pi}{6}$?

A. $30°$ B. $60°$ C. $45°$ D. $210°$

Find the exact value of the expression.

11. $\tan 240°$ **12**. $\sin(-630°)$ **13**. $\sec\frac{2\pi}{3}$

14. $\cos 2\pi$ **15**. $\csc\left(-\frac{5\pi}{6}\right)$ **16**. $\cot 675°$

17. $\sin 270° + \cos 180°$ **18**. $\sin 210° - \tan 45°$

Graph at least one full cycle of the given function. Find all missing information and be sure to label all axes!

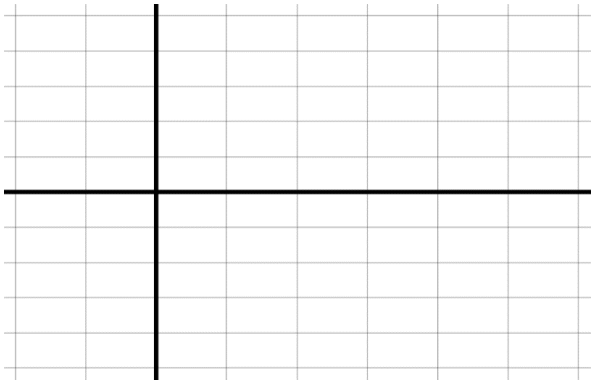
19. $\boldsymbol{y = -\cos 6\theta + 2}$

Period:

Vertical Shift:

Amplitude:

Phase Shift:



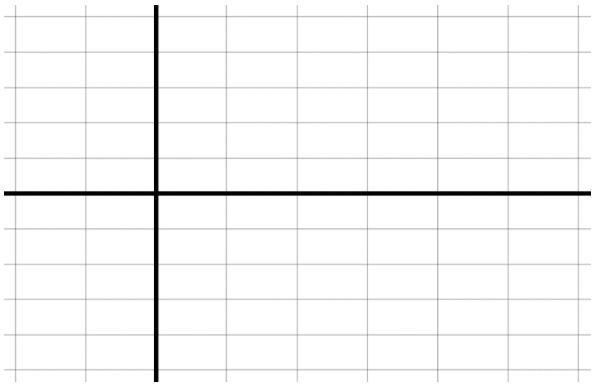
20. $y = 3\sin\frac{1}{2}(\theta + 180°)$

Period:

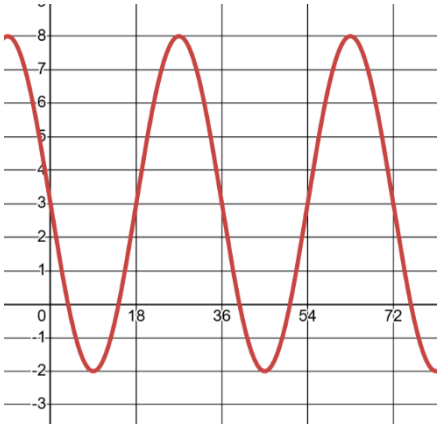
Vertical Shift:

Amplitude:

Phase Shift:



Use the graph of the function below to answer #21-22 MCQ.



21. What is the **period** of the function?

A. $18°$
B. $36°$
C. $54°$
D. $10°$

22. What is the **amplitude** of the function?

A. 8
B. 3
C. -5
D. 5

23. [**MCQ**] The graph of which equation has a maximum of 3, a minimum of -7, a period of $180°$, and contains the point $(0, 3)$?

A. $y = 5\cos 2\theta - 2$
B. $y = 5\sin 2\theta - 2$
C. $y = 3\cos 2\theta - 7$
D. $y = 3\sin 2\theta - 7$

24. [**MCQ**] Luisa is jumping on a trampoline. The function $H(t) = -0.6\cos\left(\frac{4\pi}{5}t\right) + 1.5$ models her distance, in meters, above the ground t seconds after she starts jumping. What is the maximum height Luisa reaches above the ground?

A. $0.9\ m$ B. $1.5\ m$ C. $2.1\ m$ D. $2.5\ m$

Find the exact value of the expression. Leave your answers in degrees.

25. $\sin^{-1}\left(-\frac{1}{2}\right)$ **26.** $\cos^{-1}\left(-\frac{1}{2}\right) + 83°$ **27.** $-3\tan^{-1} 1$

28. $\arccos(-1)$ **29.** $\arcsin\left(\frac{\sqrt{2}}{2}\right)$ **30.** $\arctan 0 - \sin^{-1}(-1)$

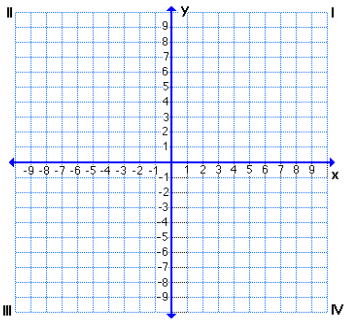
Unit 7: Conics

1. [**MCQ**] Which of the following equations represents the graph of a circle that has the points $(-5,7)$ and $(9,5)$ as the endpoints of its diameter?

A. $x^2 + y^2 = 50$
B. $(x-2)^2 + (y-6)^2 = 50$
C. $(x-2)^2 + (y-6)^2 = \sqrt{50}$
D. $(x+2)^2 + (y+6)^2 = 50$

2. Graph the **CIRCLE** and find its center and radius.

$(x-4)^2 + (y+3)^2 = 9$



Center:

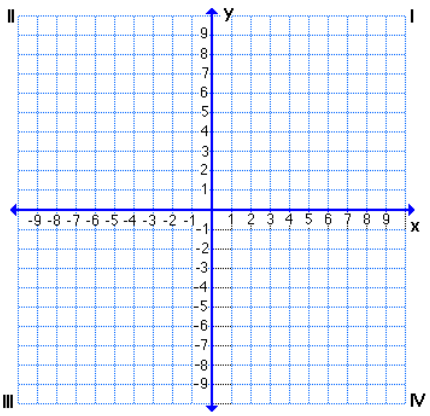
Radius:

3. [**MCQ**] Identify the **center** of the circle: $x^2 + 4x + y^2 - 8y + 4 = 0$

A. $(-2,4)$
B. $(4,-8)$
C. $(0,0)$
D. $(2,-4)$

4. Graph the **ELLIPSE** and find its center, vertices, co-vertices, and foci.

$\frac{(x+4)^2}{16} + (y-5)^2 = 1$ Center:

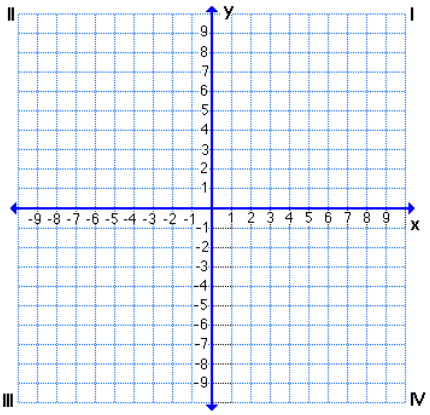


Vertices: Co-Vertices:

Foci:

5. Graph the **ELLIPSE** and find its center, vertices, co-vertices, and foci.

$\frac{(x-3)^2}{9} + \frac{y^2}{25} = 1$ Center:



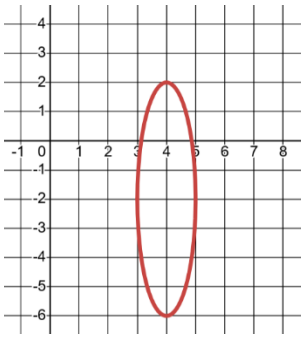
Vertices: Co-Vertices:

Foci:

6. [**MCQ**] Find the coordinates of the **vertices** of the **ELLIPSE**: $\frac{(x-5)^2}{4}+\frac{(y-3)^2}{49}=1$

A. $(-2,3),(12,3)$
B. $(3,3),(8,3)$
C. $(5,-4),(5,10)$
D. $(5,1),(5,5)$

7. [**MCQ**] Which equation best models the graph shown?



A. $x^2+\frac{y^2}{16}=1$
B. $(x-4)^2+\frac{(y+2)^2}{16}=1$
C. $(x-4)^2+\frac{(y+2)^2}{4}=1$
D. $\frac{(x-4)^2}{16}+(y+2)^2=1$

8. Graph the **HYPERBOLA** and find its center, vertices, foci, and slopes of asymptotes.

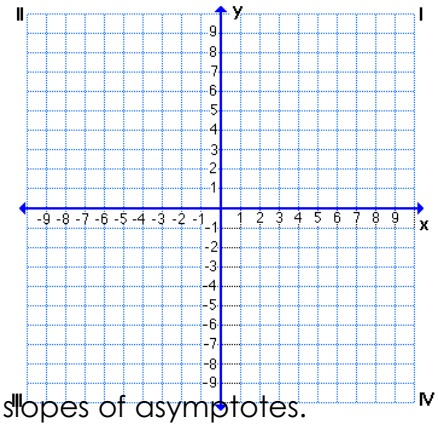
$\frac{y^2}{9}-\frac{(x-3)^2}{25}=1$

Center:

Vertices:

Foci:

Slopes of Asymptotes:



9. Graph the **HYPERBOLA** and find its center, vertices, foci, and slopes of asymptotes.

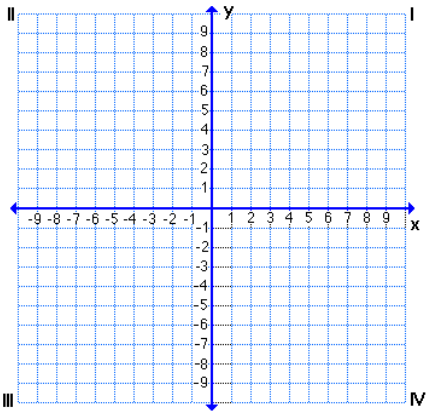
$\frac{(x+2)^2}{36}-\frac{(y+1)^2}{4}=1$

Center:

Vertices:

Foci:

Slopes of Asymptotes:



10. [**MCQ**] Identify the coordinates of the **foci** for the **HYPERBOLA**: $\frac{(x+5)^2}{16}-\frac{(y+2)^2}{4}=1$

A. $(-5\pm2\sqrt{5},\ -2)$
B. $(-5,\ -2\pm2\sqrt{5})$
C. $(-5\pm2\sqrt{3},\ -2)$
D. $(-5,\ -2\pm2\sqrt{3})$

11. [**MCQ**] Identify the **slopes** of the asymptotes for the **HYPERBOLA**: $\frac{(x-6)^2}{49} - \frac{(y+8)^2}{81} = 1$

A. $\pm\frac{81}{49}$ B. $\pm\frac{49}{81}$ C. $\pm\frac{7}{9}$ D. $\pm\frac{9}{7}$

12. [**MCQ**] Which equation represents the graph of a <u>vertical</u> **HYPERBOLA**?

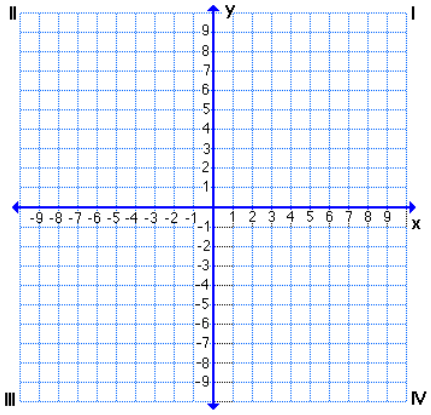
A. $\frac{y^2}{4} - \frac{x^2}{36} = 1$ B. $\frac{x^2}{4} - \frac{y^2}{36} = 1$ C. $\frac{x^2}{4} + \frac{y^2}{36} = 1$ D. $\frac{x^2}{36} + \frac{y^2}{4} = 1$

13. Graph the **PARABOLA** and find its vertex, focus, directrix, and length of latus rectum.

$(y+6)^2 = -8(x-2)$ Vertex:

Focus: Directrix:

Latus Rectum:

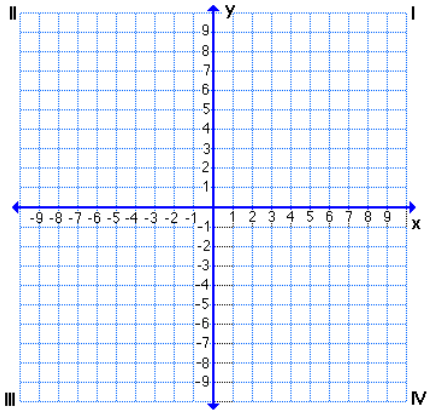


14. Graph the **PARABOLA** and find its vertex, focus, directrix, and length of latus rectum.

$(x+3)^2 = 12(y-4)$ Vertex:

Focus: Directrix:

Latus Rectum:



15. [**MCQ**] Find the coordinate of the **focus** of the **PARABOLA**: $(x+7)^2 = -20(y-2)$

A. $(-2, 2)$
B. $(-12, 2)$
C. $(-7, -3)$
D. $(-7, 7)$

16. [**MCQ**] Find the equation of the **directrix** of the **PARABOLA**: $y^2 = 4(x+6)$

A. $y = -7$
B. $x = -7$
C. $y = -5$
D. $x = -5$

Final Exam Review 2026 Answers
A2CP

UNIT 4

1. C **2**. $63x^4$ **3**. $\frac{1}{3x^2}$ **4**. $\frac{1}{x^{30}y^8}$ **5**. $\frac{7x^{13}y^{10}z}{3}$ **6**. 864 **7**. $\frac{1}{2x^2}$ **8**. D **9**. 81 **10**. 9 **11**. -4 **12**. 7

13. 1 **14**. 4 **15**. D **16**. D: $[0,\infty)$; R: $(-\infty,5]$ **17**. D: $(-\infty,\infty)$; R: $(-\infty,\infty)$

UNIT 5

1. $Asym: y=6; D: (-\infty,\infty); R: (-\infty,6); EB: \begin{matrix} As\ x\to-\infty, f(x)\to-\infty \\ As\ x\to\infty, f(x)\to 6 \end{matrix}$

2. $Asym: y=-3; D: (-\infty,\infty); R: (-3,\infty); EB: \begin{matrix} As\ x\to-\infty, f(x)\to-3 \\ As\ x\to\infty, f(x)\to\infty \end{matrix}$

3. A **4**. $\frac{19}{3}$ **5**. $\frac{3}{4}$ **6**. $\frac{2}{7}$ **7**. $\frac{3}{8}$

8. $Asym: x=3; D: (3,\infty); R: (-\infty,\infty); EB: \begin{matrix} As\ x\to 3^+, f(x)\to-\infty \\ As\ x\to\infty, f(x)\to\infty \end{matrix}$

9. $Asym: x=0; D: (-\infty,0); R: (-\infty,\infty); EB: \begin{matrix} As\ x\to-\infty, f(x)\to\infty \\ As\ x\to 0^-, f(x)\to-\infty \end{matrix}$

10. C **11**. B **12**. 3 **13**. -1 **14**. -2 **15**. 4 **16**. 2 **17**. -2 **18**. 2 **19**. B **20**. $f^{-1}(x)=10^{x-5}+2$

21. $g^{-1}(x)=\log_3(-x-4)$ **22**. 3.07 **23**. 4.43 **24**. 1.24 **25**. -0.46 **26**. $\frac{81}{2}$ **27**. 5 **28**. -1 **29**. 52

30. 15.8 trees **31**. 20th floor **32**. B **33**. 23.1 years **34**. 54.9 years

UNIT 6

1. $\sin\theta=\frac{6\sqrt{2}}{11}; \cot\theta=\frac{7\sqrt{2}}{12}; \sec\theta=\frac{11}{7}; \cos\theta=\frac{7}{11}$ **2**. 7.74 **3**. 23.6° **4**. $\tan\theta=-\frac{40}{9}; \csc\theta=\frac{41}{40}$

5. $\sin\theta=-\frac{3}{5}; \sec\theta=-\frac{5}{4}$ **6**. $\sin\theta=-\frac{24}{25}; \sec\theta=\frac{25}{7}; \tan\theta=-\frac{24}{7}$ **7**. A **8**. C **9**. A **10**. A **11**. $\sqrt{3}$

12. 1 **13**. -2 **14**. 1 **15**. -2 **16**. -1 **17**. -2 **18**. $-\frac{3}{2}$

19. Period: 60°; vert shift: up 2; amp: 1 w/reflection; phase: none

20. Period: 720°; vert shift: none; amp: 3; phase: left 180°

21. B **22**. D **23**. A **24**. C **25**. $-30°$ **26**. 203° **27**. $-135°$ **28**. 180° **29**. 45° **30**. 90°

UNIT 7

1. B **2**. center: $(4,-3); r=3$ **3**. A **4**. C: $(-4,5)$; V: $(-8,5),(0,5)$; CV: $(-4,6),(-4,4)$; F: $\left(-4\pm\sqrt{15},5\right)$

5. C: $(3,0)$; V: $(3,5),(3,-5)$; CV: $(0,0),(6,0)$; F: $(3,4),(3,-4)$ **6**. C **7**. B

8. C: $(3,0)$; V: $(3,3),(3,-3)$; F: $\left(3,\ \pm\sqrt{34}\right)$; $Slopes$: $\pm\frac{3}{5}$

9. C: $(-2,-1)$; V: $(-8,-1),(4,-1)$; F: $\left(-2\pm2\sqrt{10},-1\right)$; $Slopes$: $\pm\frac{2}{6}$ **10**. A **11**. D **12**. A

13. V: $(2,-6)$; F: $(0,-6)$; Dir: $x=4$; $Latus$: 8 **14**. V: $(-3,4)$; F: $(-3,7)$; Dir: $y=1$; $Latus$: 12

15. C **16**. B