

Honors Algebra 2 Final**Multiple Choice***Identify the choice that best completes the statement or answers the question.*

____ 1. Suppose $f(x) = 4x - 2$ and $g(x) = -2x + 1$.

Find the value of $\frac{f(5)}{g(-3)}$.

- a.
- $1\frac{5}{9}$
- b.
- $2\frac{4}{7}$
- c.
- -2
- d.
- 2

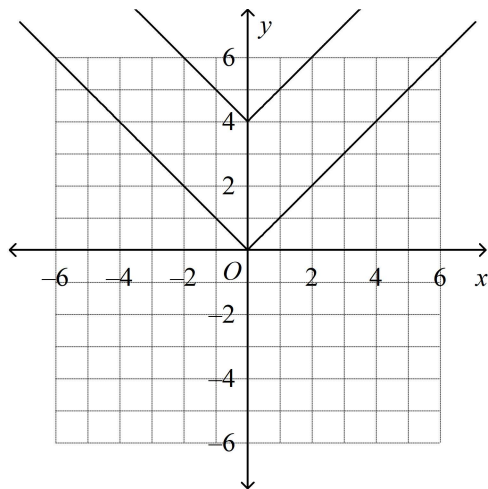
____ 2. Find the point-slope form of the equation of the line passing through the points $(-6, -4)$ and $(2, -5)$.

- a.
- $y + 4 = \frac{1}{8}(x - 2)$
- c.
- $y + 5 = -\frac{1}{8}(x + 6)$
-
- b.
- $y + 4 = -\frac{1}{8}(x + 6)$
- d.
- $y + 4 = \frac{1}{8}(x + 6)$

____ 3. Write two linear equations you can use to graph $y = |x + 7|$.

- a.
- $\begin{cases} y = -x + 7 \\ y = -x - 7 \end{cases}$
- c.
- $\begin{cases} y = x + 7 \\ y = -x - 7 \end{cases}$
-
- b.
- $\begin{cases} y = -x + 7 \\ y = x - 7 \end{cases}$
- d.
- $\begin{cases} y = x - 7 \\ y = -x - 7 \end{cases}$

____ 4. Write the equation for the translation of $y = |x|$.



- a.
- $y = |x + 4|$
- b.
- $y = |x| + 4$
- c.
- $y = |x| - 4$
- d.
- $y = |x - 4|$

____ 5. Write the equation that is the translation of $y = |x|$ left 1 unit and up 2 units.

- a.
- $y = |x - 2| - 1$
- c.
- $y = |x - 1| + 2$
-
- b.
- $y = |x + 1| + 2$
- d.
- $y = |x + 2| - 1$

Name: _____

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_____ 6. Find a quadratic function to model the values in the table. Predict the value of y for $x = 6$.

x	y
-1	2
0	-2
3	10

a. $y = -2x^2 + 2x - 2$; -58

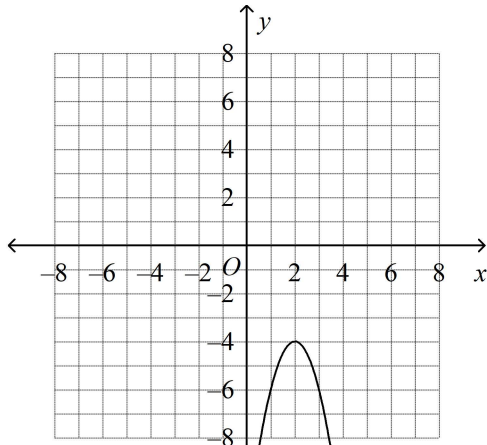
b. $y = 2x^2 - 2x - 2$; 60

c. $y = 2x^2 - 2x - 2$; 58

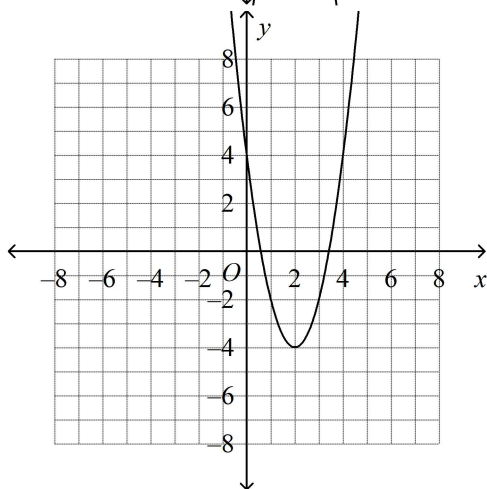
d. $y = -2x^2 + 2x + 2$; -58

_____ 7. Which is the graph of $y = -2(x - 2)^2 - 4$?

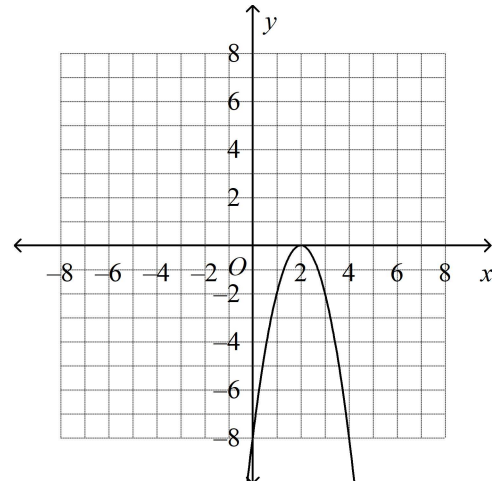
a.



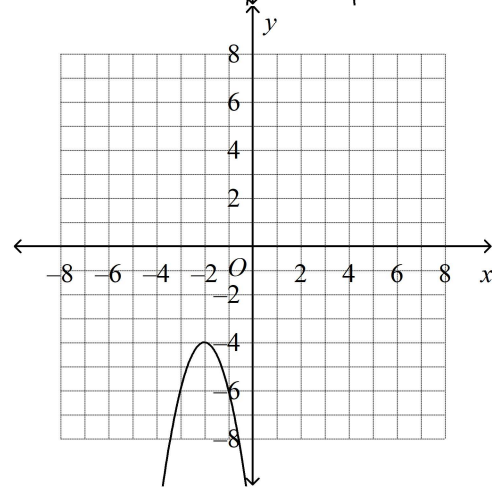
b.



c.



d.



_____ 8. Identify the vertex and the y -intercept of the graph of the function $y = -3(x + 2)^2 + 5$.

a. vertex: $(-2, 5)$;
 y -intercept: -7

b. vertex: $(2, -5)$;
 y -intercept: -12

c. vertex: $(2, 5)$;
 y -intercept: -7

d. vertex: $(-2, -5)$;
 y -intercept: 9

Factor the expression.

- _____ 9. $9x^2 - 16$
a. $(3x + 4)(-3x - 4)$ c. $(-3x + 4)(3x - 4)$
b. $(3x + 4)(3x - 4)$ d. $(3x - 4)^2$
- _____ 10. $x^3 + 216$
a. $(x - 6)(x^2 + 6x + 36)$ c. $(x - 6)(x^2 - 6x + 36)$
b. $(x + 6)(x^2 - 6x + 36)$ d. $(x + 6)(x^2 + 6x + 72)$
- _____ 11. Solve by factoring.
 $4x^2 + 28x - 32 = 0$
a. $8, -\frac{1}{2}$ b. $-8, 4$ c. $-8, 1$ d. $1, -\frac{1}{2}$

Solve the equation by finding square roots.

- _____ 12. $3x^2 = 21$
a. $\sqrt{7}$ c. $\frac{-\sqrt{21}}{3}, \frac{\sqrt{21}}{3}$
b. $\sqrt{7}, -\sqrt{7}$ d. $-\sqrt{7}, \sqrt{21}$
- _____ 13. $-6 - \sqrt{-48}$
a. $6 + i\sqrt{48}$ c. $6 - 4i\sqrt{3}$
b. $-6 - 4i\sqrt{3}$ d. $-6 + 4i\sqrt{3}$

Simplify the expression.

- _____ 14. $(2 + 5i)(-1 + 5i)$
a. $-27 + 5i$ c. $-2 + 25i$
b. $23 + 5i$ d. $-2 + 5i$

Solve the equation.

- _____ 15. $x^2 + 18x + 81 = 25$
a. $14, 4$ c. $14, -14$
b. $-4, -14$ d. $-4, 4$
- _____ 16. $\sqrt{x + 10} - 7 = -5$
a. 14 b. -8 c. 4 d. -6

Solve the quadratic equation by completing the square.

_____ 17. $3x^2 + 7x = -9$

a. $\frac{7}{6} \pm \frac{\sqrt{20}}{6} i$

c. $-\frac{7}{6} \pm \frac{\sqrt{59}}{6} i$

b. $-\frac{7}{3} \pm \frac{\sqrt{101}}{3} i$

d. $\frac{7}{3} \pm \frac{\sqrt{59}}{3} i$

_____ 18. Write $4x^3 + 8x^2 - 96x$ in factored form.

a. $6x(x+4)(x-4)$

c. $4x(x+6)(x+4)$

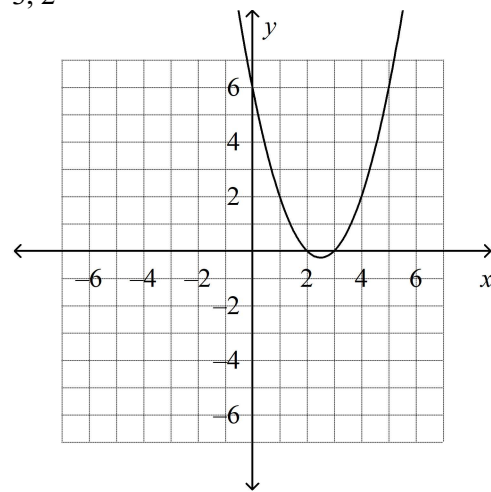
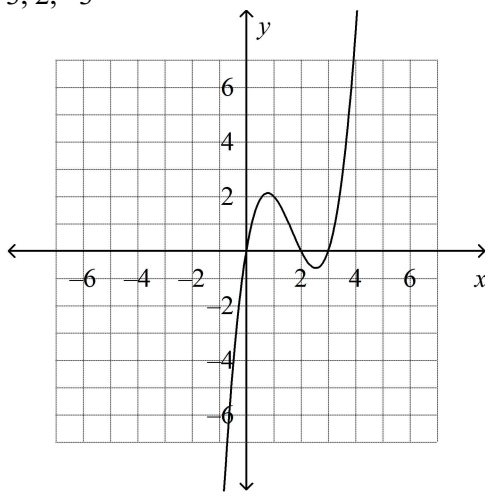
b. $4x(x-4)(x+6)$

d. $-4x(x+6)(x+4)$

_____ 19. Find the zeros of $y = x(x-3)(x-2)$. Then graph the equation.

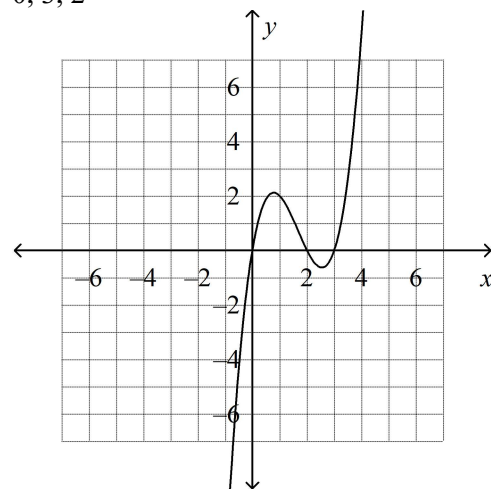
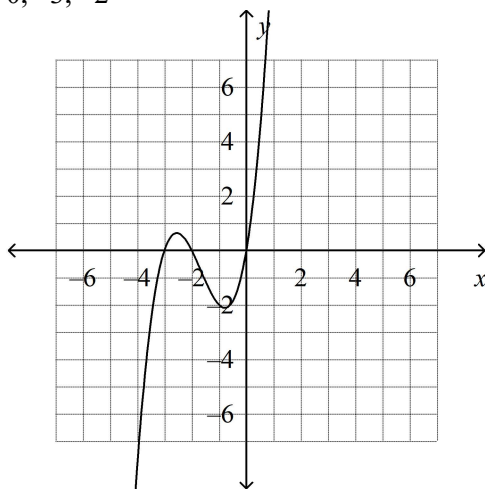
a. 3, 2, -3

c. 3, 2



b. 0, -3, -2

d. 0, 3, 2



_____ 20. Divide $3x^3 - 3x^2 - 4x + 3$ by $x + 3$.

a. $3x^2 - 12x + 32$

c. $3x^2 + 6x - 40$

b. $3x^2 - 12x + 32, R -93$

d. $3x^2 + 6x - 40, R 99$

Divide using synthetic division.

- _____ 21. $(x^4 + 15x^3 - 77x^2 + 13x - 36) \div (x - 4)$
- a. $x^3 - 23x^2 - 75x - 5$ c. $x^3 - x^2 + 9x + 19$
 b. $x^3 + 15x^2 - 23x - 5$ d. $x^3 + 19x^2 - x + 9$

Multiply and simplify if possible.

- _____ 22. $\sqrt{6} \cdot \sqrt{2}$
- a. $2\sqrt{3}$ b. $\sqrt{12}$ c. $3\sqrt{2}$ d. not possible
- _____ 23. Simplify $\sqrt[3]{128a^{13}b^6}$. Assume that all variables are positive.
- a. $4a^4b^2\sqrt[3]{2a}$ c. $4a^4b^3\sqrt[3]{a}$
 b. $2a^4b^2\sqrt[3]{4a}$ d. none of these

Simplify.

- _____ 24. $-\sqrt{5} - 3\sqrt{36} + 6\sqrt{5}$
- a. $5\sqrt{5} - 18$ c. $-5\sqrt{5} - 18$
 b. $5\sqrt{5} - 3\sqrt{36}$ d. none of these

Multiply.

- _____ 25. $(7 - \sqrt{2})(8 + \sqrt{2})$
- a. $54 + 56\sqrt{2}$ c. $13 + 15\sqrt{2}$
 b. $54 - \sqrt{2}$ d. $58 + 56\sqrt{2}$

- _____ 26. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

- a. $3^{\frac{3}{8}}\sqrt{x^3}$ b. $\sqrt[8]{3x^3}$ c. $3^{\frac{3}{8}}\sqrt{x^8}$ d. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

- _____ 27. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.

- a. 23 b. -53 c. -9 d. 3

- _____ 28. Suppose you invest \$1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?

- a. \$800.26 b. \$6,701.28 c. \$10,138.07 d. \$1,923.23

Evaluate the logarithm.

- _____ 29. $\log_3 243$
- a. 5 b. -5 c. 4 d. 3

Write the expression as a single logarithm.

- _____ 30. $5 \log_b q + 2 \log_b y$
- a. $\log_b(q^5 y^2)$ c. $\log_b(q^5 + y^2)$
b. $(5 + 2) \log_b(q + y)$ d. $\log_b(qy^{5+2})$

Expand the logarithmic expression.

- _____ 31. $\log_7 \frac{n}{2}$
- a. $\log_7 n - \log_7 2$ c. $\log_7 2 - \log_7 n$
b. $\frac{\log_7 n}{\log_7 2}$ d. $-n \log_7 2$
- _____ 32. Use the properties of logarithms to evaluate $\log_3 9 + \log_3 36 - \log_3 4$.
- a. 2 b. 4 c. 8 d. 41
- _____ 33. Solve $\frac{1}{16} = 64^{4x-3}$.
- a. $\frac{1}{12}$ b. $\frac{1}{4}$ c. $\frac{7}{12}$ d. $\frac{11}{12}$
- _____ 34. Solve $\log(4x + 10) = 3$.
- a. $-\frac{7}{4}$ b. $\frac{495}{2}$ c. 250 d. 990
- _____ 35. Solve $\ln 2 + \ln x = 5$.
- a. 50,000 b. 74.2 c. 10 d. 3

Use natural logarithms to solve the equation. Round to the nearest thousandth.

- _____ 36. $6e^{4x} - 2 = 3$
- a. -0.448 b. 0.327 c. 0.067 d. -0.046

Find any points of discontinuity for the rational function.

- _____ 37. $y = \frac{(x+6)(x+2)(x+8)}{(x+9)(x+7)}$
- a. $x=6, x=2, x=8$ c. $x=-9, x=-7$
b. $x=9, x=7$ d. $x=-6, x=-2, x=-8$

_____ 38. Describe the vertical asymptote(s) and hole(s) for the graph of $y = \frac{(x-5)(x-2)}{(x-2)(x+4)}$.

- a. asymptote: $x = -4$ and hole: $x = 2$
- b. asymptotes: $x = -4$ and $x = 2$
- c. asymptote: $x = -5$ and hole: $x = -4$
- d. asymptote: $x = 4$ and hole: $x = -2$

_____ 39. Find the horizontal asymptote of the graph of $y = \frac{6x^2 + 5x + 9}{7x^2 - x + 9}$.

- a. $y = \frac{6}{7}$
- b. $y = 0$
- c. $y = 1$
- d. no horizontal asymptote

Multiply or divide. State any restrictions on the variables.

_____ 40. $\frac{c+1}{c-5} \div \frac{c-2}{c^2-7c+10}$

- a. $\frac{(c+1)(c-2)}{(c-5)^2(c-2)}, c \neq 5, 2, 2$
- b. $\frac{(c+1)(c-2)}{c-2}, c \neq 5, 2$
- c. $\frac{(c+1)(c-2)}{c-2}, c \neq 2, 2$
- d. $\frac{(c+1)(c-2)}{(c-5)^2(c-2)}, c \neq 5, 2$

Add or subtract. Simplify if possible.

_____ 41. $\frac{7}{a+8} + \frac{7}{a^2-64}$

- a. $\frac{7a-49}{(a-8)(a+8)}$
- b. $\frac{14}{a^2+a-56}$
- c. $\frac{14}{(a-8)(a+8)}$
- d. $\frac{7a+63}{(a-8)(a+8)}$

Solve the equation. Check the solution.

_____ 42. $\frac{-2}{x+4} = \frac{4}{x+3}$

- a. $-\frac{13}{6}$
- b. -11
- c. $-\frac{8}{3}$
- d. $-\frac{11}{3}$

_____ 43. $\frac{5}{6w} + \frac{1}{w} = -4$

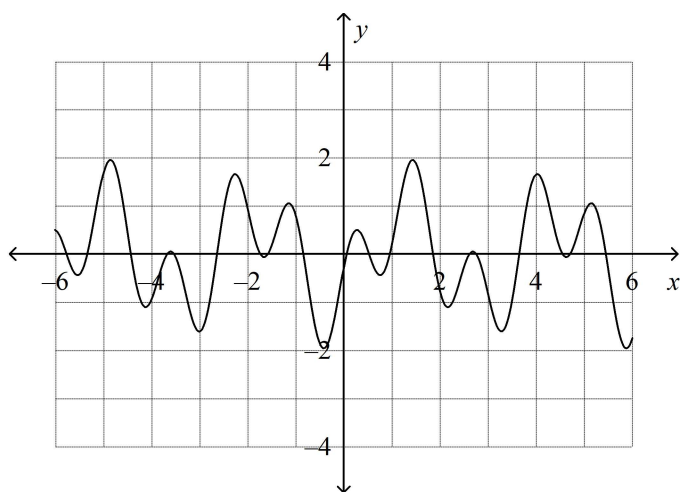
- a. $-\frac{3}{14}$
- b. $\frac{11}{6}$
- c. $-\frac{11}{24}$
- d. $-\frac{31}{24}$

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Determine whether the function shown below *is* or *is not* periodic. If it is, find the period.

____ 44.

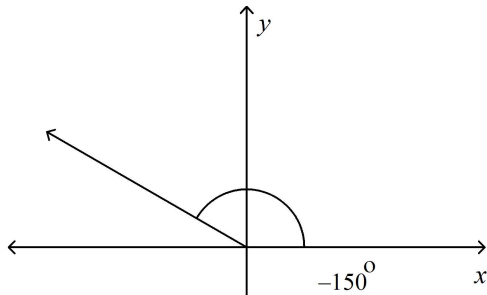


- a. periodic; about 6
- b. periodic; about 3
- c. periodic; about 12
- d. not periodic

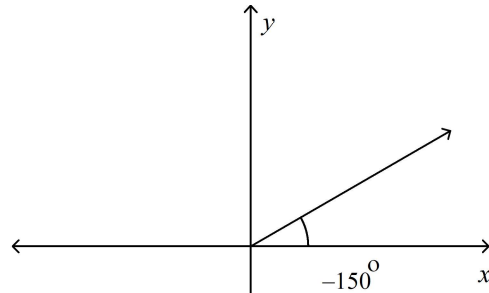
Sketch the angle in standard position.

_____ 45. -150°

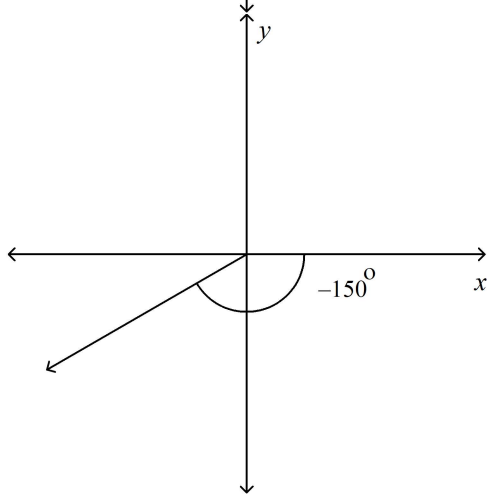
a.



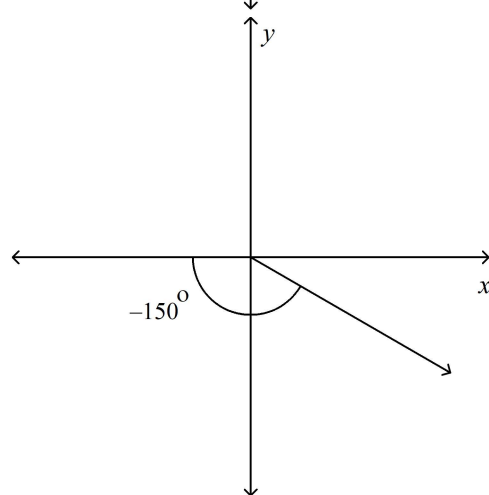
c.



b.



d.



_____ 46. Find the measure of an angle between 0° and 360° coterminal with an angle of -110° in standard position.

a. 250°

b. 20°

c. 110°

d. 70°

_____ 47. In which quadrant does the terminal side of a 118° angle lie?

a. third quadrant

c. first quadrant

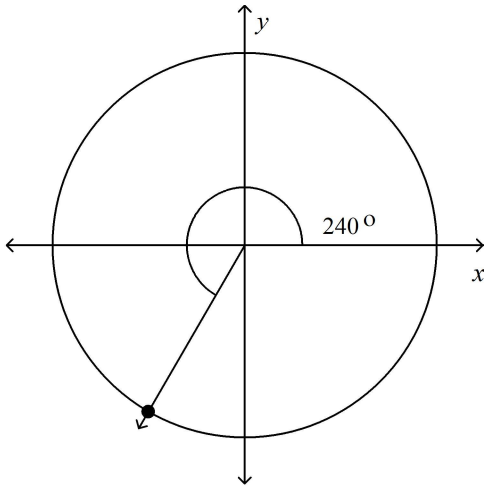
b. second quadrant

d. fourth quadrant

Name: _____

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- _____ 48. Find the cosine and sine of 240° . Round your answers to the nearest hundredth if necessary.



- a. $-0.5, -0.87$ b. $-0.87, -0.5$ c. $0, -1$ d. $-0.95, -0.55$
- _____ 49. Find the exact value of $\cos 300^\circ$ and $\sin 300^\circ$.
- a. $\cos = -\frac{1}{2}, \sin = \frac{\sqrt{3}}{2}$ c. $\cos = -\frac{\sqrt{3}}{2}, \sin = \frac{1}{2}$
- b. $\cos = \frac{1}{2}, \sin = -\frac{\sqrt{3}}{2}$ d. $\cos = \frac{\sqrt{3}}{2}, \sin = -\frac{1}{2}$

Write the measure in radians. Express the answer in terms of π .

- _____ 50. 320°
- a. $\frac{16\pi}{9}$ b. $\frac{9\pi}{16}$ c. $\frac{9}{16\pi}$ d. $\frac{16}{9\pi}$

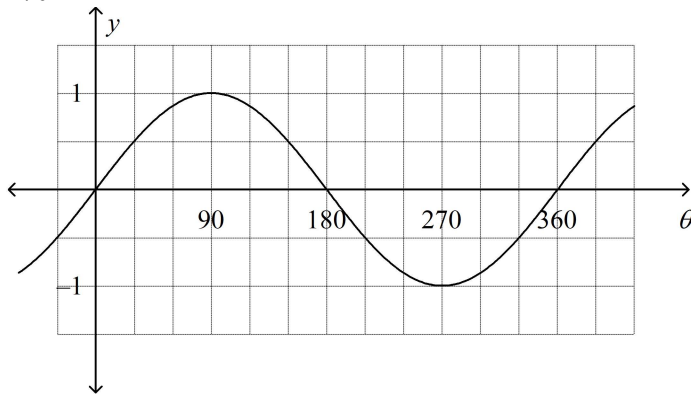
Write the measure in degrees.

- _____ 51. $\frac{3\pi}{5}$ radians
- a. $108\pi^\circ$ b. $\frac{\pi}{300}^\circ$ c. 108° d. 1.88°

- _____ 52. Find the exact values of $\cos\left(\frac{3\pi}{4} \text{ radians}\right)$ and $\sin\left(\frac{3\pi}{4} \text{ radians}\right)$.
- a. $\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}$ b. $-\frac{1}{2}, \frac{\sqrt{3}}{2}$ c. $-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ d. $-\frac{\sqrt{3}}{2}, \frac{1}{2}$

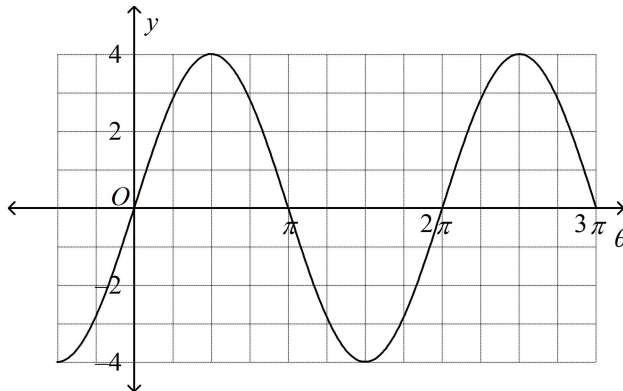
Use the graph to find the value of $y = \sin \theta$ for the value of θ .

____ 53. 270°



- a. -0.4 b. -0.8 c. -0.6 d. -1

____ 54. Find the amplitude of the sine curve shown below.



- a. 2π b. 8 c. 2 d. 4

____ 55. Write an equation of the cosine function with amplitude 2 and period 4π .

- a. $y = -\frac{1}{2} \cos\left(\frac{1}{2}x\right)$ c. $y = 2 \cos\left(\frac{1}{2}x\right)$
 b. $y = \frac{1}{2} \cos\left(\frac{1}{4}x\right)$ d. $y = -2 \cos\left(\frac{1}{4}x\right)$

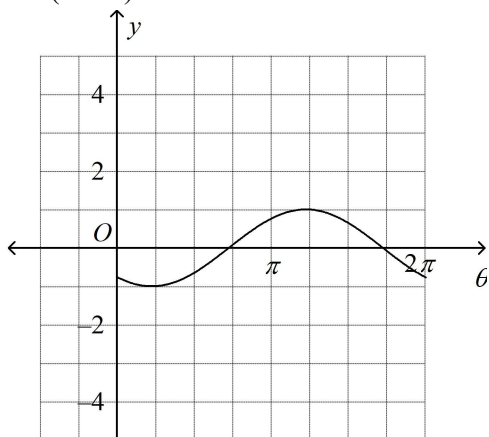
____ 56. Identify the period for $y = \tan \frac{3\pi}{4} \theta$ and tell where two asymptotes occur for the function.

- a. period = $\frac{3\pi}{4}$; two asymptotes at $x = -\frac{3\pi}{8}$ and $x = \frac{3\pi}{8}$
- b. period = $\frac{8}{3}$; two asymptotes at $x = -\frac{4}{3}$ and $x = \frac{4}{3}$
- c. period = $\frac{4}{3}$; two asymptotes at $x = \frac{2}{3}$ and $x = 2$
- d. period = $\frac{4}{3}$; two asymptotes at $x = 0$ and $x = \frac{4}{3}$

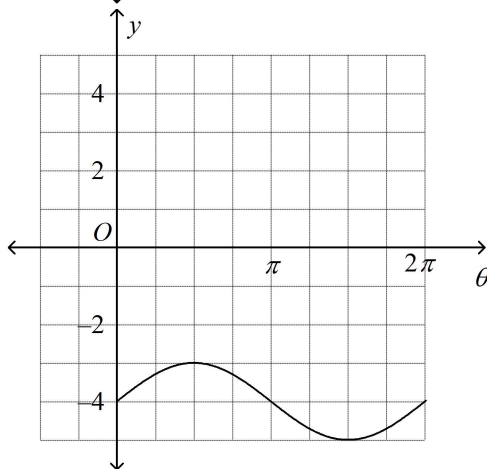
Graph the function in the interval from 0 to 2π .

____ 57. $y = \sin(x + 4)$

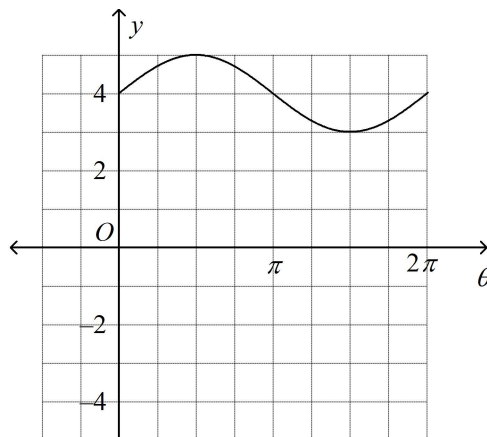
a.



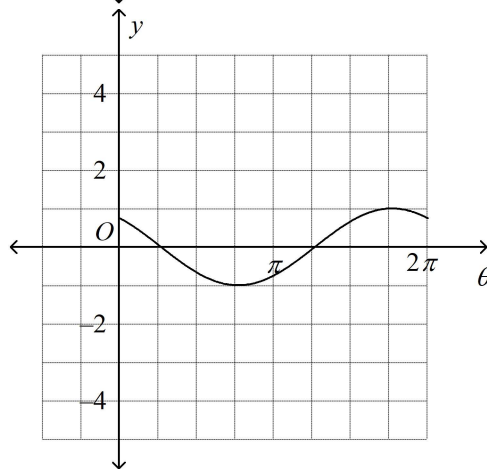
b.



c.



d.



____ 58. Find the exact value of $\csc 135^\circ$. If the expression is undefined, write *undefined*.

- a. 0
- b. undefined
- c. $\frac{1}{2}$
- d. $\sqrt{2}$

____ 59. Find the exact value of $\cot 45^\circ$. If the expression is undefined, write *undefined*.

- a. 0
- b. 1
- c. -1
- d. undefined

Name: _____

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Simplify the trigonometric expression.

_____ 60. $\sec \theta \cos \theta$

a. $\tan \theta$

b. 1

c. $\cot \theta$

d. $\sin \theta$