Name_____ Date_____

Second Semester Final Exam Practice Questions (Chap 7 - Chap 14)

Multiple Choice: *Identify the choice that best completes the statement or answers the question.*

D 1. Use inverse operations to write the inverse of $f(x) = x - \frac{1}{7}$.

A. $f^{-1}(x) = x - \frac{1}{7}$
C. $f^{-1}(x) = x - \frac{6}{7}$
B. $f^{-1}(x) = x + \frac{6}{7}$
D. $f^{-1}(x) = x + \frac{1}{7}$

A 2. Express $\log_3 6 + \log_3 4.5$ as a single logarithm. Simplify, if possible.

$= \log_3 (6 \cdot 4.5) = \log_3 27 =$ $3^{\textcircled{3}} = 27$

A. 3
C. $\log_3 10.5$
B. $\log_6 10.5$
D. 27

A 3. Express $\log_3 27^{\textcircled{3}}$ as a product. Simplify, if possible.

$3 \log_3 27 = 3 \cdot 3 = 9$ $\quad 3^x = 27$

A. –9
C. $\frac{1}{27}$
B. 3
D. 9

C 4. Suppose you deposit \$1000 in an account paying 3% ($\rightarrow 0.03$) annual interest, compounded continuously. Use $A = Pe^{rt}$ to find the balance after 10 years.

$A = 1000e^{(0.03)(10)}$

A. \$20,085.54
C. \$1349.86
B. \$1300
D. \$1068.65

C 5. Solve $8^{x+8} = 32^x$.

$2^{3(x+8)} = 2^{5(x)} \longrightarrow 3(x+8) = 5x$

A. $x = -12$
C. $x = 12$
B. $x = 22$
D. $x = -22$

D 6. Evaluate $5^{\log_5 63}$.

A. 58
C. $\log_5 63$
B. 315
D. 63

B 7. Solve $\log_4 (m - 3) + \log_4 (m + 3) = 2$.

A. $\sqrt{11}$
C. 1
B. 5
D. –5.5

$\log_4 (m-3)(m+3) = 2$

$\log_4 (m^2 - 9) = 2$

$4^2 = m^2 - 9$

$16 = m^2 - 9$

$25 = m^2$

$\pm 5 = m$

$-5 \neq$ Reject

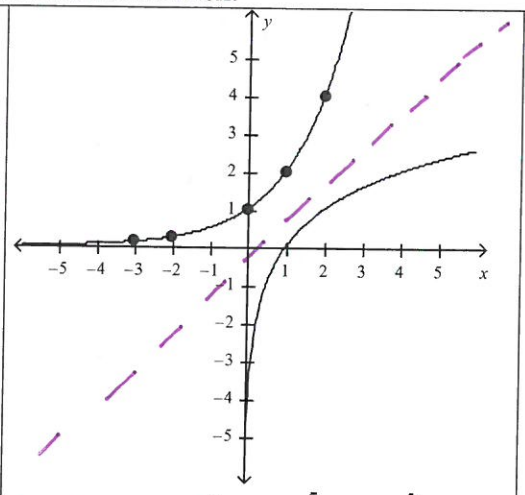
$\log_4 (-5-3)$

$\log_4 (-8)$ DOES NOT EXIST

A

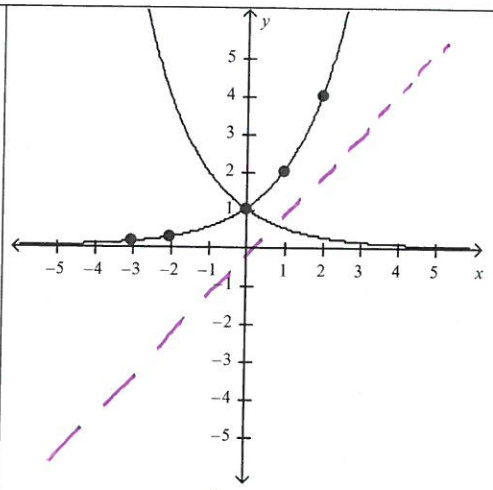
8. Use $x = -3, -2, 0, 1, 2$ to graph the function $f(x) = 2^x$. Then graph its inverse. Describe the domain and range of the inverse function.

A.



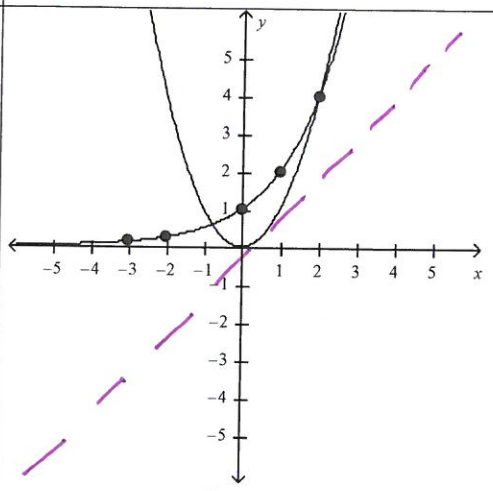
The domain of $f^{-1}(x)$ is $\{x|x > 0\}$, and the range is all real numbers.

C.



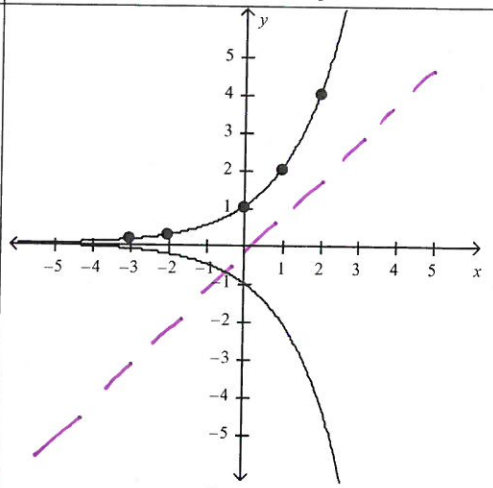
The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y > 0\}$.

B.



The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y \geq 0\}$.

D.



The domain of $f^{-1}(x)$ is all real numbers, and the range is $\{y|y < 0\}$.

C

9. Solve $\log_{\frac{1}{5}} x = -1$.

A. $\frac{1}{25}$

B. -5

C. 5

D. $-\frac{1}{5}$

minus → ÷

$\log_2 \frac{64}{4} = \log_2 16$ $\{2^x = 16$

C 10. Express $\log_2 64 - \log_2 4$ as a single logarithm. Simplify, if possible.

A. $\log_2 4$
B. 8
C. 4
D. $\log_2 60$

C 11. For what value(s) of m is the expression $\frac{m^2 - 2m + 1}{2m^2 + m - 3}$ undefined?

$(2m+3)(m-1)$

A. $-\frac{3}{2}, 0, 1$
B. $-1, \frac{3}{2}$
C. $-\frac{3}{2}, 1$
D. $\frac{3}{2}$

B 12. Simplify $\frac{10 - x^2 - 3x}{x^2 + 2x - 8}$. Identify any x-values for which the expression is undefined.

A. $\frac{-x-5}{x+4}$ The expression is undefined at $x = -4$.
B. $\frac{-x-5}{x+4}$ The expression is undefined at $x = 2$ and $x = -4$.
C. $\frac{x+5}{x+4}$ The expression is undefined at $x = 2$ and $x = -4$.
D. $\frac{x+5}{x+4}$ The expression is undefined at $x = -4$.

$\frac{-(x^2+3x-10)}{x^2+2x-8}$

$\frac{-(x+5)(x-2)}{(x+4)(x-2)}$

$x \neq -4, 2$

D 13. Add $\frac{x+6}{x-7} + \frac{-12x-59}{x^2-3x-28}$.

A. $\frac{-11x-53}{x^2-2x-35}$
B. $\frac{x^2+10x+24}{(x+4)(x-7)}$
C. $\frac{x+6}{(x-7)(x+4)}$
D. $\frac{x+5}{x+4}$

C 14. Multiply $\frac{8x^4y^2}{3z^3} \cdot \frac{9xy^2z^6}{4y^4}$. Assume that all expressions are defined.

A. $6x^4yz^2$
B. $6x^5y^8z^9$
C. $6x^5z^3$
D. $\frac{3}{2}x^3y^2z$

For problems 15-18, simplify each expression.

B 15. $\frac{x^2 + 5x + 4}{x^2 + 2x + 1} \cdot \frac{2x + 2}{x + 4}$

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

B. 2

C. $\frac{(x + 4)^2}{2(x + 1)^2}$

D. $\frac{x + 4}{2(x + 1)}$

B 16. $\frac{6n}{n^2 - 9} - \frac{3}{n + 3} = \frac{6n}{(n+3)(n-3)} - \frac{3(n-3)}{(n+3)(n-3)}$

A. $\frac{3}{n + 3}$

B. $\frac{3}{n - 3}$

C. $\frac{6n - 3}{n^2 - n + 12}$

D. $\frac{6n - 3}{n^2 - 9}$

$\frac{6n - 3n + 9}{(n+3)(n-3)}$

$\frac{3n + 9}{(n+3)(n-3)}$

$\frac{3(n+3)}{(n+3)(n-3)}$

C 17. $\frac{m}{m - 5} \div \frac{2}{5 - m} = \frac{m}{m-5} + \frac{2}{m-5}$

$-1(m-5)$

A. $\frac{2m}{m - 5}$

B. $\frac{m - 2}{m - 5}$

C. $\frac{m + 2}{m - 5}$

D. $\frac{2m}{(m - 5)^2}$

D 18. $\frac{a + b}{3} \div \frac{a^2 + b^2}{12}$

A. $\frac{a + b}{4(a^2 + b^2)}$

B. $\frac{4}{a + b}$

C. $\frac{4}{a - b}$

D. $\frac{4(a + b)}{a^2 + b^2}$

$\frac{m}{m-5} - \left(\frac{2}{m-5}\right)$

multiply top & bottom

LCD = 10(x−4) → $\dfrac{-5\cdot 10+(x-6)(x-4)}{10(x+3)}$

C 19. Simplify $\dfrac{\frac{-5}{x-4}+\frac{x-6}{10}}{\frac{x+3}{x-4}}$. Assume that all expressions are defined.

A. $\dfrac{x-56}{10(x+3)}$

B. $\dfrac{x^2-10x-26}{10\left(x^2-x-12\right)}$

C. $\dfrac{x^2-10x-26}{10(x+3)}$

D. $\dfrac{x^3-14x^2+14x+104}{10\left(x^2-x-12\right)}$

D 20. Solve $\dfrac{x^2+x-30}{x-5}=11$. Check your answer. $\{x\neq 5\}$ $\dfrac{(x+6)(x-5)}{(x-5)}=11$

A. $x=5$
B. $x=16$
C. $x=-6$
D. There is no solution because the original equation is undefined at $x=5$.

$x+6=11$
$x=5$
REJECT

D 21. Evaluate the piecewise function $f(x)=\begin{cases}11 & \text{if } x\le 5\\ -14 & \text{if } 5<x\le 6\\ 1 & \text{if } 6<x\end{cases}$ for $x=-1$ and $x=9$. $f(-1)=11$ $f(9)=1$

A. $f(-1)=11;\ f(9)=-14$
B. $f(-1)=-1;\ f(9)=9$
C. $f(-1)=5;\ f(9)=6$
D. $f(-1)=11;\ f(9)=1$

A 22. Determine the equations of any vertical asymptotes of the graph of $f(x)=\dfrac{x^2+5x+6}{x-1}$.

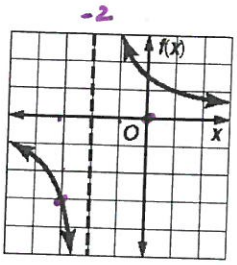
A. $x=1$
B. $x=-2$
C. $x=-2, x=-3$
D. $y=1$

C 23. Determine the values of x for any holes in the graph of $f(x)=\dfrac{x+5}{x^2+6x+5}$.

A. $x=5$
B. $x=1$
C. $x=-5$
D. $x=-1, x=-5$

A

24. Which rational function is graphed?



x y
(-3, -3)

A. $f(x) = \frac{3}{x+2}$ ⇒ $y = \frac{3}{x+2}$

B. $f(x) = \frac{3}{x-2}$

C. $f(x) = \frac{x}{x+2}$ $y = \frac{x}{x+2}$

D. $f(x) = \frac{x}{x-2}$

$f(x) \to f(x+4)$

A

25. Given $f(x) = \begin{cases} 2x^2+1 & \text{if } x > 0 \\ -x+1 & \text{if } x \le 0 \end{cases}$, write the rule for $g(x)$, a horizontal translation of $f(x)$ 4 units to the left.

A. $g(x) = \begin{cases} 2x^2+16x+33 & \text{if } x > -4 \\ -x-3 & \text{if } x \le -4 \end{cases}$

B. $g(x) = \begin{cases} 2x^2+16x+33 & \text{if } x > 0 \\ -x-3 & \text{if } x \le 0 \end{cases}$

C. $g(x) = \begin{cases} 2x^2-16x-31 & \text{if } x > 4 \\ -x+5 & \text{if } x \le 4 \end{cases}$

D. $g(x) = \begin{cases} \frac{1}{8}x^2+1 & \text{if } x > 0 \\ -\frac{1}{4}x+1 & \text{if } x \le 0 \end{cases}$

C

26. Given $f(x) = 2x^2 + 8x - 4$ and $g(x) = -5x + 6$, find $(f-g)(x)$.

A. $(f-g)(x) = 7x^2 + 2x - 4$

B. $(f-g)(x) = 7x^2 + 8x - 10$

C. $(f-g)(x) = 2x^2 + 13x - 10$

D. $(f-g)(x) = 2x^2 + 3x + 2$

D

27. Given $f(x) = x^3$ and $g(x) = 4x + 3$, find $g(f(3))$.

A. $g(f(3)) = 108$

B. $g(f(3)) = 405$

C. $g(f(3)) = 3,375$

D. $g(f(3)) = 111$

D

28. Given $f(x) = \sqrt{x-2}$ and $g(x) = \frac{6}{x-3} + 1$, write the composite function $g(f(x))$ and state its domain.

A. $g(f(x)) = \frac{6}{\sqrt{x-2}-3} + 1, x \ge 2$

B. $g(f(x)) = \sqrt{\frac{6}{x-3} - 1}, x \ge 9$

C. $g(f(x)) = \sqrt{\frac{6}{x-3} - 1}, x \ne 3$

D. $g(f(x)) = \frac{6}{\sqrt{x-2}-3} + 1, x \ge 2, x \ne 11$

A

29. Determine by composition whether $f(x) = \frac{1}{5}x + 4$ and $g(x) = 5x - 20$ are inverses.

A. Yes, $f(g(x)) = g(f(x)) = x$.

B. No, $f(g(x)) \ne x$.

$y = (3x-24)^4$ D: $x \in \mathbb{R}$ R: $y \geq 0$

$x = (3y-24)^4$ D: $x \geq 0$ R: $y \in \mathbb{R}$

$\pm\sqrt[4]{x} = 3y - 24$

$\pm\sqrt[4]{x} + 24 = 3y \rightarrow \pm\frac{1}{3}\sqrt[4]{x} + 8 = y$

B 30. Find the inverse of $f(x) = (3x-24)^4$. Determine whether it is a function, and state its domain and range.

A. $y = \frac{1}{3}\sqrt[4]{x} + 8$;

The inverse is a function. The domain is $[0, \infty)$ and the range is $[8, \infty)$.

B. $y = \pm\frac{1}{3}\sqrt[4]{x} + 8$;

The inverse is not a function. The domain is $[0, \infty)$ and the range is $(-\infty, \infty)$. → all ℝ #'s

C. $y = \sqrt[4]{\frac{1}{3}x + 8}$; $x \geq 0$

The inverse is a function. The domain is $[-24, \infty)$ and the range is $[0, \infty)$.

D. $y = \pm\sqrt[4]{\frac{1}{3}x + 8}$;

The inverse is not a function. The domain is $[-24, \infty)$ and the range is $(-\infty, \infty)$.

Find the exact solution(s) of each system of equations.

D 31. $x^2 + y^2 = 25$ and $9y = 4x^2$ USE ELIMINATION

A. (4, 3), (–4, 3)
B. (3, 4), (3, –4)
C. (4, 3), (4, –3)
D. (3, 4), (–3, 4)

$4x^2 + 4y^2 = 100$

$-4x^2 + 9y = 0$

$4y^2 + 9y = 100$

$4y^2 + 9y - 100 = 0$

C 32. Find the center and radius of a circle that has a diameter with endpoints (–9, – 6) and (–1, 0).

A. center (4, 3); radius 5
B. center (8, 6); radius 10
C. center (–5, – 3); radius 5
D. center (–10, – 6); radius 10

A 33. Write the equation of a circle with center (8, 7) and radius $r = 6$.

A. $36 = (x-8)^2 + (y-7)^2$
B. $6 = (x-8)^2 + (y-7)^2$
C. $6 = (x-8) + (y-7)$
D. $36 = (x-7)^2 + (y-8)^2$

B 34. Identify the conic section that the equation $4x^2 - 5xy - 5y^2 - 3x + 2y + 9 = 0$ represents.

A. circle
B. hyperbola
C. ellipse
D. parabola

B 35. Identify the conic section the equation $\frac{(x-2)^2}{3^2} + \frac{(y-4)^2}{7^2} = 1$ represents.

A. parabola
B. ellipse
C. circle
D. hyperbola

B 36. Find the first 5 terms of the sequence with $a_1 = 6$ and $a_n = 2a_{n-1} - 1$ for $n \geq 2$.

A. 1, 2, 3, 4, 5
B. 6, 11, 21, 41, 81
C. 6, 12, 24, 48, 96
D. 6, 7, 8, 9, 10

$a_n = a_1 + (n-1)d$

B

37. Write an equation for the nth term of the arithmetic sequence $-7, -2, 3, 8, \ldots$.

$d = -2 + 7 = 5$

$a_n = -7 + (n-1)5$

$a_n = -7 + 5n - 5$

$a_n = 5n - 12$

A. $a_n = n + 5$
B. $a_n = 5n - 12$
C. $a_n = -7n + 12$
D. $a_n = -7(n + 5)$

B

38. Find $\sum_{n=1}^{7} 4(-3)^{n-1}$.

A. -2186
B. 2188
C. -728
D. 2916

B

39. Find the first 5 terms of the sequence $a_n = 2^n - 5$.

n	$2^n - 5$
1	$2^1 - 5 = -3$
2	$2^2 - 5 = -1$
3	$2^3 - 5 = 3$
4	
5	

A. $-4, -1, 4, 11, 20$
B. $-3, -1, 3, 11, 27$
C. $7, 9, 13, 21, 37$
D. $-3, -1, 1, 3, 5$

D

40. Find the 22nd term in the arithmetic sequence $-5, -9, -13, -17, -21, \ldots$

$d = -9 - (-5)$

$d = -4$

$a_n = a_1 + (n-1)d$

$a_{22} = -5 + (22-1)(-4)$

A. -93
B. -84
C. -110
D. -89

C

41. Find the 5th term of the arithmetic sequence with $a_7 = 25$ and $a_{13} = 55$.

A. 5
B. 20
C. 15
D. -5

D

42. Find S_n for the arithmetic series in which $a_1 = 3$, $d = \frac{1}{2}$, and $a_n = \frac{17}{2}$.

$S_n = \frac{n(a_1 + a_n)}{2}$

FIND n FIRST

$a_n = a_1 + (n-1)d$

A. 27
B. 54
C. $\frac{139}{2}$
D. 69

C

43. Write an equation for the nth term of the geometric sequence $-10, 5, -\frac{5}{2}, \ldots$

A. $a_n = -10\left(\frac{1}{2}\right)^{n-1}$
B. $a_n = 10\left(-\frac{1}{2}\right)^{n-1}$
C. $a_n = -10\left(-\frac{1}{2}\right)^{n-1}$
D. $a_n = -10\left(-\frac{1}{2}\right)^{-n-1}$

D

44. Find the 7th term of the geometric sequence $-4, 12, -36, 108, -324, \ldots$

$n = 7$

$a_n = a_1 r^{n-1}$

$r = \frac{12}{-4} = -3$

A. 8,748
B. 972
C. $-2,920$
D. $-2,916$

For problem 45, find the sum of each infinite geometric series, if it exists.

C 45. $\sum_{n=1}^{\infty} 10\left(\frac{1}{5}\right)^{n-1}$

$r = \left|\frac{1}{5}\right| < 1$ CONVERGES $S = \frac{a_1}{1-r}$

$a_1 = 10$

A. $\frac{25}{3}$

B. 8

C. $\frac{25}{2}$

D. does not exist

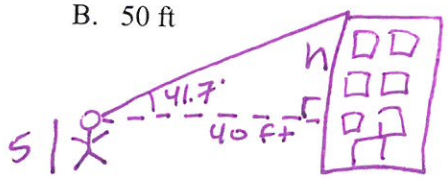
A 46. A surveyor whose eye level is 5 feet above the ground determines the angle of elevation to the top of an office building to be 41.7°. If the surveyor is standing 40 feet from the base of the building, what is the height of the building to the nearest foot?

A. 41 ft

B. 50 ft

C. 32 ft

D. 36 ft



$\tan 41.7 = \frac{h}{40}$

$h = 40(\tan 41.7°)$

ADD 5

B 47. Find $\sin\theta$ if $\cos\theta = -\frac{2}{3}$ and $90° < \theta < 180°$.

$\cos\theta = \frac{x}{r} = \frac{-2}{3}$ $\quad x = -2 \quad r = 3$

$x^2 + y^2 = r^2$

$4 + y^2 = 9$

$y^2 = 5$

$y = \sqrt{5}$

$\frac{y}{r} = \frac{\sqrt{5}}{3}$

A. $-\frac{\sqrt{5}}{3}$

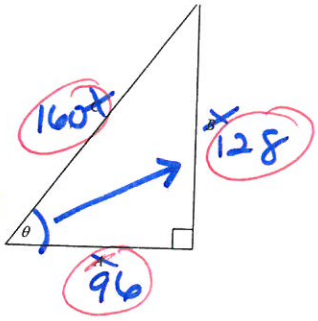
B. $\frac{\sqrt{5}}{3}$

C. $-\frac{\sqrt{13}}{3}$

D. $\frac{\sqrt{13}}{3}$

D 48. Find the value of the sine, cosine, and tangent functions for θ where $A = 96$, $B = 128$, and $C = 160$.

$\sin\theta = \frac{OPP}{HYP} = \frac{128 \div 32}{160 \div 32} = \frac{4}{5}$



A. $\sin\theta = \frac{3}{5}$; $\cos\theta = \frac{4}{5}$; $\tan\theta = \frac{3}{4}$

B. $\sin\theta = \frac{3}{5}$; $\cos\theta = \frac{4}{5}$; $\tan\theta = \frac{4}{3}$

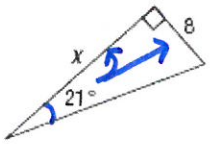
C. $\sin\theta = \frac{4}{5}$; $\cos\theta = \frac{3}{5}$; $\tan\theta = \frac{3}{4}$

D. $\sin\theta = \frac{4}{5}$; $\cos\theta = \frac{3}{5}$; $\tan\theta = \frac{4}{3}$

$\cos\theta = \frac{ADJ}{HYP} = \frac{96}{160} = \frac{3}{5}$

$\tan\theta = \frac{OPP}{ADJ} = \frac{128}{96} = \frac{4}{3}$

C 49. Which equation can be used to find x?



A. $\sin 21° = \frac{8}{x}$

B. $\tan 21° = \frac{x}{8}$

C. $\tan 21° = \frac{8}{x}$

D. $\sin 21° = \frac{x}{8}$

C 50. Rewrite $\frac{2\pi}{9}$ radians in degree measure.

A. 20°

B. 80°

C. 40°

D. $\frac{40}{\pi}°$

B 51. Find the exact value of $\sin\theta$ if the terminal side of θ in standard position contains the point $(-4, -3)$.

A. $-\frac{4}{5}$

B. $-\frac{3}{5}$

C. $\frac{3}{5}$

D. $\frac{4}{5}$

A 52. Find the exact value of $\cos(-\frac{\pi}{4})$.

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

B. $-\frac{\sqrt{2}}{2}$

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

D. $-\frac{\sqrt{3}}{2}$

A 53. Find the measures of a positive angle and a negative angle that are coterminal with 307°.

A. 667° and −53°

B. 487° and 127°

C. 397° and 217°

D. 53° and −307°

D

54. Find the measure of the reference angle for $\theta = 159°$.

A. 201°
B. 111°
C. –21°
D. 21°

A

55. $P(-7,-2)$ is a point on the terminal side of θ in standard position. Find the exact value of the six trigonometric functions for θ.

A. $\sin\theta = -\frac{2\sqrt{53}}{53}$; $\csc\theta = -\frac{\sqrt{53}}{2}$; $\cos\theta = -\frac{7\sqrt{53}}{53}$; $\sec\theta = -\frac{\sqrt{53}}{7}$; $\tan\theta = \frac{2}{7}$; $\cot\theta = \frac{7}{2}$

B. $\sin\theta = -\frac{\sqrt{53}}{7}$; $\csc\theta = -\frac{7\sqrt{53}}{53}$; $\cos\theta = -\frac{\sqrt{53}}{2}$; $\sec\theta = -\frac{2\sqrt{53}}{53}$; $\tan\theta = \frac{2}{7}$; $\cot\theta = \frac{7}{2}$

C. $\sin\theta = \frac{\sqrt{53}}{7}$; $\csc\theta = \frac{7\sqrt{53}}{53}$; $\cos\theta = \frac{\sqrt{53}}{2}$; $\sec\theta = \frac{2\sqrt{53}}{53}$; $\tan\theta = \frac{2}{7}$; $\cot\theta = \frac{7}{2}$

D. $\sin\theta = -\frac{7\sqrt{53}}{53}$; $\csc\theta = -\frac{\sqrt{53}}{7}$; $\cos\theta = -\frac{2\sqrt{53}}{53}$; $\sec\theta = -\frac{\sqrt{53}}{2}$; $\tan\theta = \frac{7}{2}$; $\cot\theta = \frac{2}{7}$

B

56. Find the area of $\triangle ABC$ if $A = 72°$, $b = 9$ feet and $c = 10$ feet. SAS $A = \frac{1}{2}bc\sin A$

A. 85.6 ft^2
B. 42.8 ft^2
C. 45.0 ft^2
D. 13.9 ft^2

A

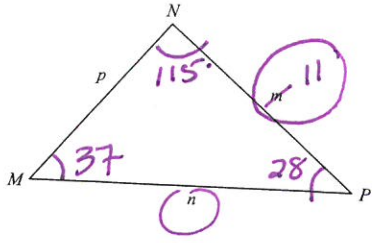
57. Find all possible values of $\sin^{-1}\frac{\sqrt{3}}{2}$.

A. $\frac{\pi}{3} + (2\pi)n$, $\frac{2\pi}{3} + (2\pi)n$
B. 0.0151
C. $\frac{\pi}{6} + (2\pi)n$, $\frac{5\pi}{6} + (2\pi)n$
D. $\frac{\pi}{4} + (2\pi)n$, $\frac{3\pi}{4} + (2\pi)n$

A

58. Solve the triangle. $m\angle N = 115°$, $m\angle P = 28°$, and $m = 11$. Round to the nearest tenth. LAW OF SINES

$m = 180 - (115 + 28) = 37$



A. $m\angle M = 37°$, $n \approx 16.6$, $p \approx 8.6$
B. $m\angle M = 37°$, $n \approx 7.3$, $p \approx 8.6$
C. $m\angle M = 37°$, $n \approx 16.6$, $p \approx 14.1$
D. $m\angle M = 37°$, $n \approx 7.3$, $p \approx 14.1$

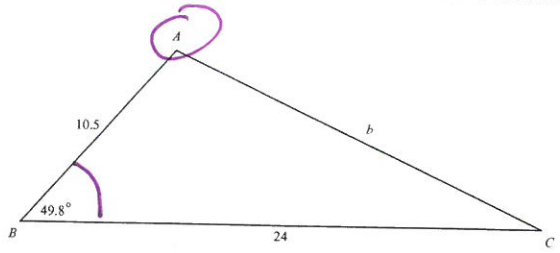
$\frac{\sin 37}{11} = \frac{\sin 115}{n}$

$n = \frac{11\sin 115}{\sin 37} \approx 16.6$

$\frac{\sin 37}{11} = \frac{\sin 28}{p}$

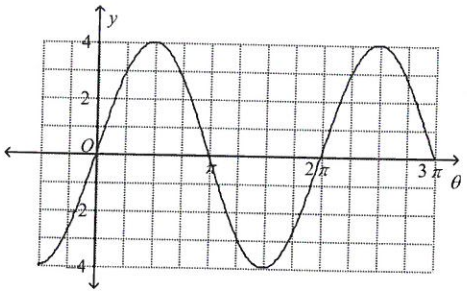
$p = \frac{11\sin 28}{\sin 37} \approx 8.6$

C 59. Use the given measurements to solve ΔABC. Round to the nearest tenth. SAS LAW OF COSINES



A. $b = 17.4$; $m\angle A = 116.5°$; $m\angle C = 13.7°$
B. $b = 18.4$; $m\angle A = 109.2°$; $m\angle C = 21.0°$
C. $b = 19.0$; $m\angle A = 105.2°$; $m\angle C = 25.0°$
D. $b = 19.9$; $m\angle A = 99.6°$; $m\angle C = 30.6°$

A 60. Find the amplitude of the sine curve shown below.



A. 4
B. 2
C. π
D. 8

C OOPS 61. Find the amplitude of $y = 8 \sin 2x$.

A. 2
B. π
C. 8
D. 4

$\uparrow a \quad \uparrow b$

PERIOD $\frac{2\pi}{|b|} = \frac{2\pi}{|2|} = \frac{2\pi}{2} = \pi$

$|8| = 8$ AMP

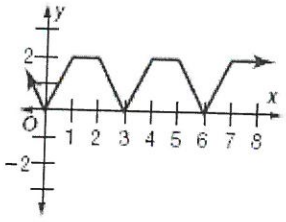
B 62. Find the period of $y = \tan 3x$.

A. $\frac{2\pi}{3}$
B. $\frac{\pi}{3}$
C. 3π
D. 6π

$\frac{\pi}{|b|} = \frac{\pi}{|3|} = \frac{\pi}{3}$

B

63. Determine the period of the function.



A. 2

B. 3

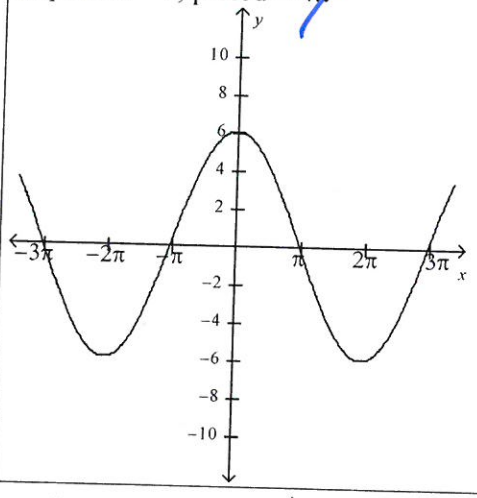
C. 6

D. 1

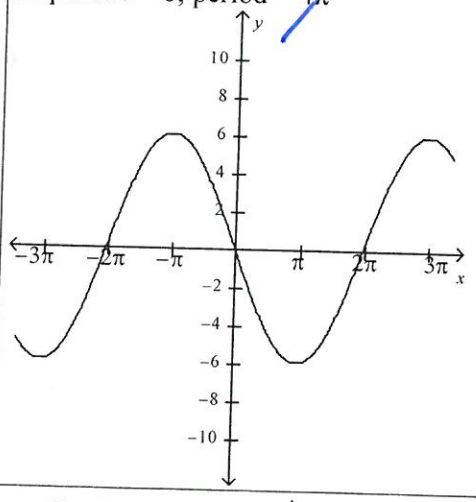
B

64. Using $f(x) = \cos x$ as a guide, graph $g(x) = 3\cos 4x$. Identify the amplitude and period.

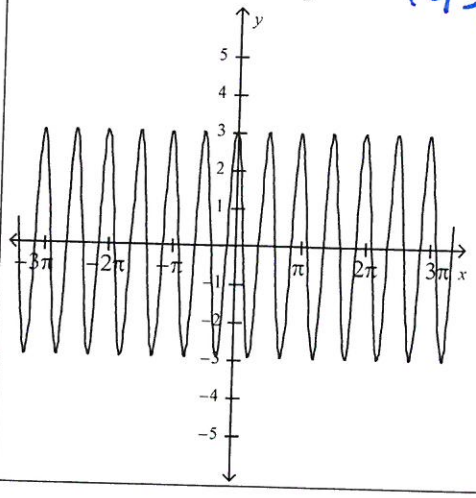
A. amplitude = 6; period = 4π



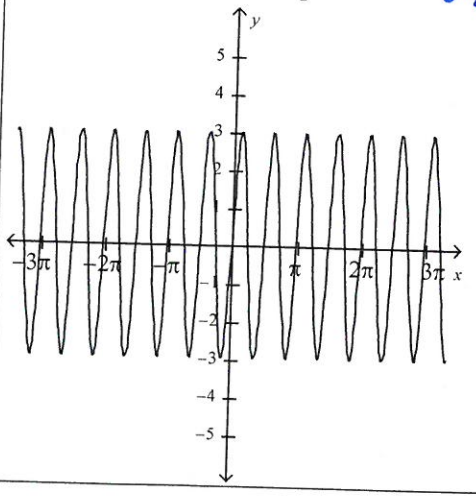
C. amplitude = 6; period = 4π



B. amplitude = 3; period = $\frac{1}{2}\pi$



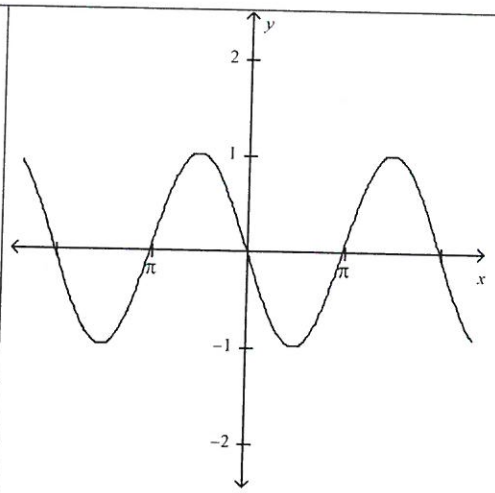
D. amplitude = 3; period = $\frac{1}{2}\pi$



C

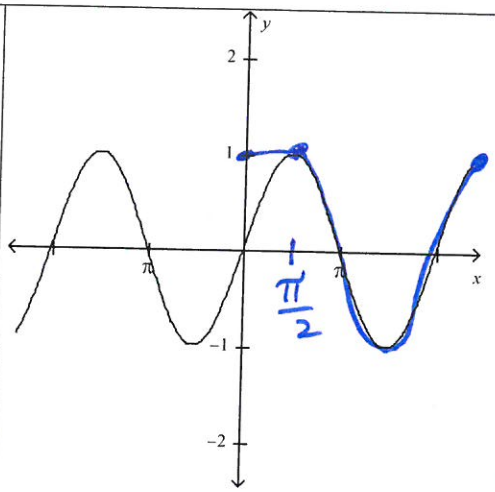
65. Using $f(x) = \cos x$ as a guide, graph $g(x) = \cos(x - \frac{\pi}{2})$. Identify the x-intercepts and phase shift.

A.



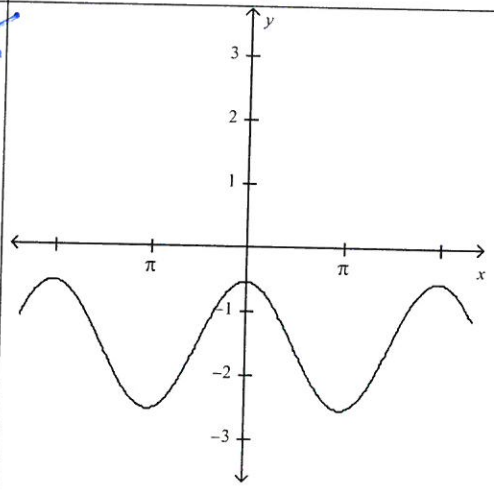
x-intercepts: $x = \frac{\pi}{2} + \pi x$ where n is an integer; phase shift: $\frac{\pi}{2}$ units to the left

C.



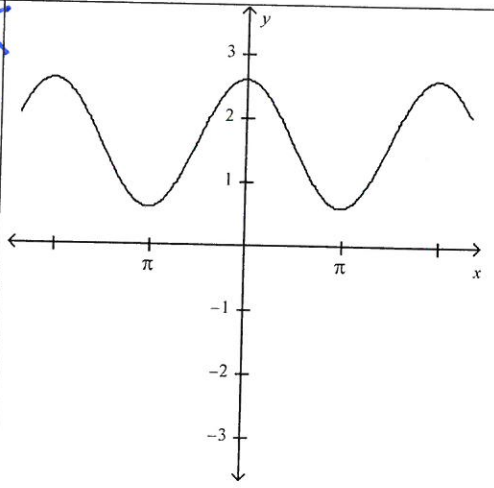
x-intercepts: $x = \frac{\pi}{2} + n\pi$ where n is an integer; phase shift: $\frac{\pi}{2}$ units to the right

B.



x-intercepts: $x = \frac{\pi}{2} + \pi x$ where n is an integer; phase shift: $\frac{\pi}{2}$ units down

D.



x-intercepts: $x = \frac{\pi}{2} + \pi x$ where n is an integer; phase shift: $\frac{\pi}{2}$ units up

BAD QUESTION!

$0.79 \approx 0.8$

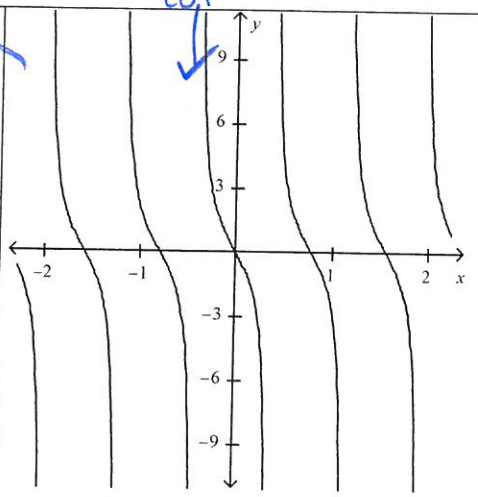
$\frac{\pi}{4}$ = PERIOD

B

66. Using $f(x) = \tan x$ as a guide, graph $g(x) = 2\tan 4x$. Identify the period, x-intercepts, and asymptotes.

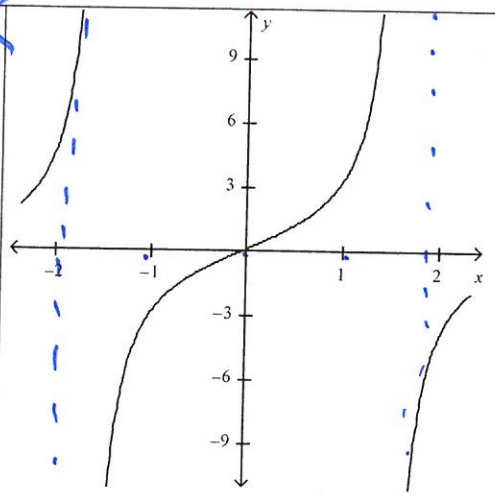
A.

COT



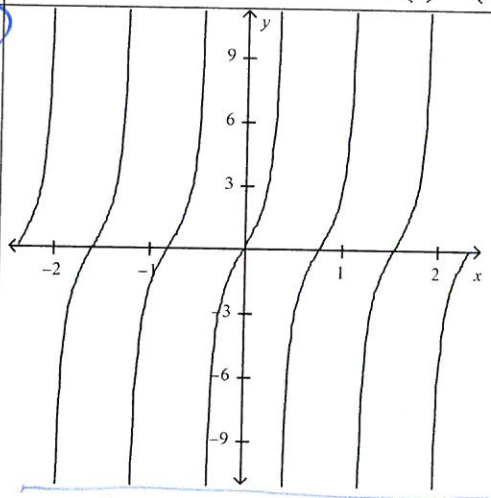
period: $\frac{\pi}{4} \approx 0.79$; x-intercepts: $\frac{\pi}{4}n$ where n is an integer; asymptotes: $x = \frac{\pi}{2(4)} + \frac{\pi n}{(4)}$

C



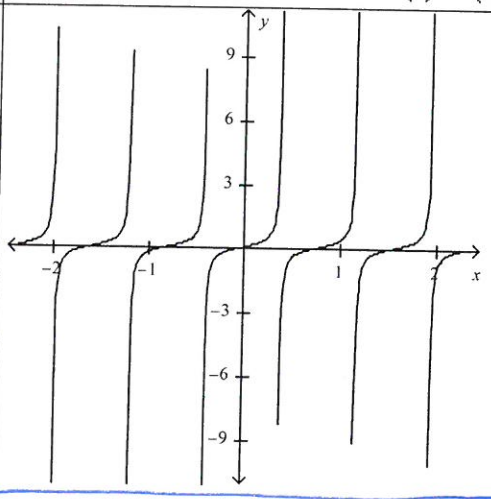
period: $\frac{\pi}{2} \approx 0.79$; x-intercepts: $\frac{\pi}{2}n$ where n is an integer; asymptotes: $x = \frac{\pi}{2(2)} + \frac{\pi n}{(2)}$

B.



period: $\frac{\pi}{4} \approx 0.79$; x-intercepts: $\frac{\pi}{4}n$ where n is an integer; asymptotes: $x = \frac{\pi}{2(4)} + \frac{\pi n}{(4)}$

D.



period: $\frac{\pi}{4} \approx 0.79$; x-intercepts: $\frac{\pi}{4}n$ where n is an integer; asymptotes: $x = \frac{\pi}{2(4)} + \frac{\pi n}{(4)}$

go online for the "good" copy

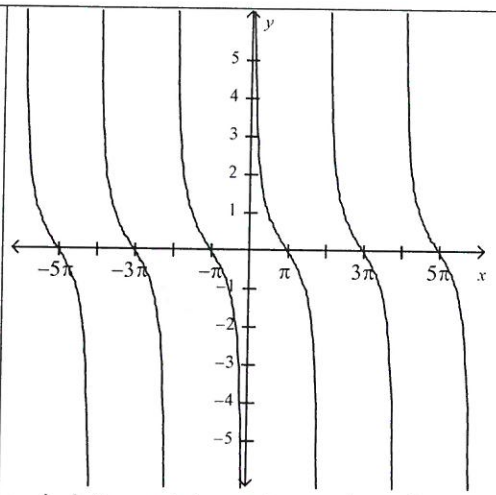
online says B THIS is wrong

→ PERIOD = $\frac{\pi}{1/4} = 4\pi$

D

67. Using $f(x) = \cot x$ as a guide, graph $f(x) = \cot \frac{1}{4}x$. Identify the period, x-intercepts, and asymptotes.

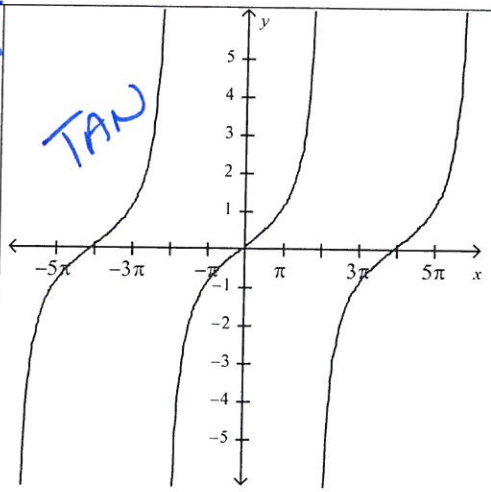
A.



period: 2π; x-intercepts: $x = 1\pi + 2\pi n$ where n is an integer; asymptotes: $x = 2\pi n$

C.

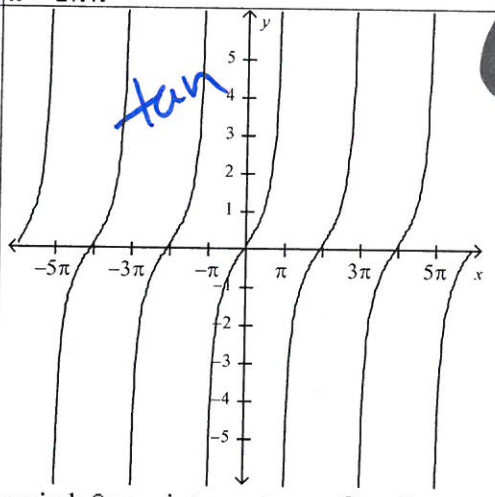
TAN



period: 4π; x-intercepts: $x = 4\pi + 4\pi n$ where n is an integer; asymptotes: $x = 2\pi n$

B.

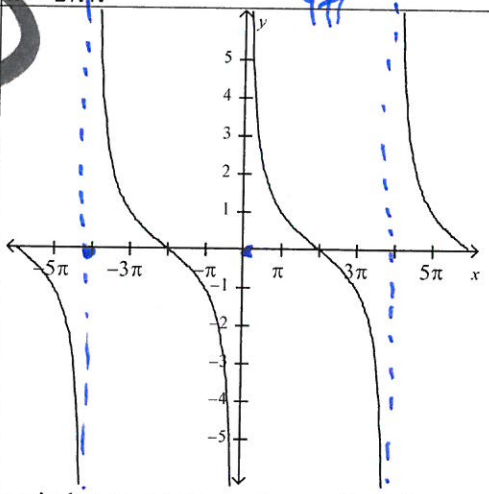
tan



period: 2π; x-intercepts: $x = 2\pi + 2\pi n$ where n is an integer; asymptotes: $x = 1\pi n$

D.

4π



period: 4π; x-intercepts: $x = 2\pi + 4\pi n$ where n is an integer; asymptotes: $x = 4\pi n$