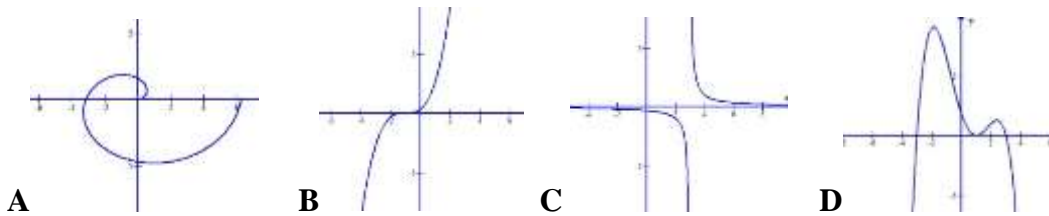


Question #1 refers to the graphs:



1. (2 pts) List the graphs that are one to one functions:

2. (3 pts) Write the equation of the line through the point $(15, 21)$ with slope $m = \frac{2}{3}$ in slope-intercept form.

3. (3 pts) Expand the expression completely: $\ln\left(\frac{x}{y^3z}\right)$

4. (4 pts) Find all solutions to: $x^3 + 7x^2 - 6x - 42 = 0$

5. (2 pts) Find the domain of the function $f(x) = \ln(x + 12)$ and write your answer in interval notation.

6. (4 pts) Find the difference quotient $\frac{f(a+h) - f(a)}{h}$ for $f(x) = 3x^2 - 11x + 5$ and simplify your answer completely.

7. (5 pts) Solve the inequality $\frac{(x+3)(x-8)}{(x-7)} \geq 0$ by using a sign chart and write your answer in interval notation.

In #8-12 refer to the function $f(x) = \frac{3x+15}{2x-8}$

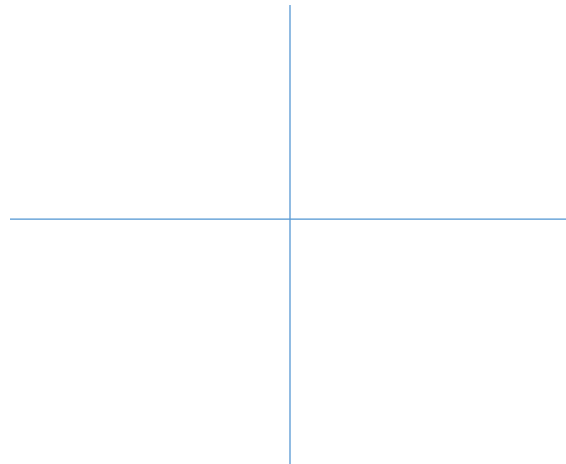
8. (1 pt) $f(x)$ has x -intercept (write the whole point):

9. (1 pt) $f(x)$ has y -intercept: (write the whole point):

10. (1 pt) $f(x)$ has Horizontal asymptotes, (write the equation of the line):

11. (1 pt) $f(x)$ has Vertical asymptotes, (write the equation of the line):

12. (4 pt) Sketch the graph of $f(x)$:

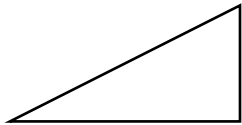


13. (4 pts) Solve the equation $e^{2x} - 3e^x - 40 = 0$

14. (3 pts) Find all solutions to the equation $\cos(5\theta) = -1$

15. (4 pts) Rewrite the expression $\frac{6}{\cot(t) + \tan(t)}$ in terms of sine and cosine and simplify completely.

16. (4 pts) Re-write $\tan(\cos^{-1}(\frac{x}{4}))$ as an algebraic function in x . Start by labeling the sides of the right triangle.



In #17-23, compute and simplify your answers completely:

17. (1 pt) For $f(x) = 3x^{-2}$, $f(-5) =$

18. (1 pt) $\ln(\frac{1}{e^5}) =$

19. (1 pt) $\ln(1) =$

20. (1 pt) $\sin(\frac{2\pi}{3}) =$

21. (1 pt) $\sec(\frac{3\pi}{4}) =$

22. (1 pt) $\tan^{-1}(1) =$

23. (1 pt) $\cos(\sin^{-1}(\frac{1}{2})) =$

24. (4 pts) Solve the equation using the quadratic formula: $3x^2 + 10x + 5 = 0$

25. (2 pts) Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number and then evaluate: $\sin(200^\circ)\cos(25^\circ) + \cos(200^\circ)\sin(25^\circ)$

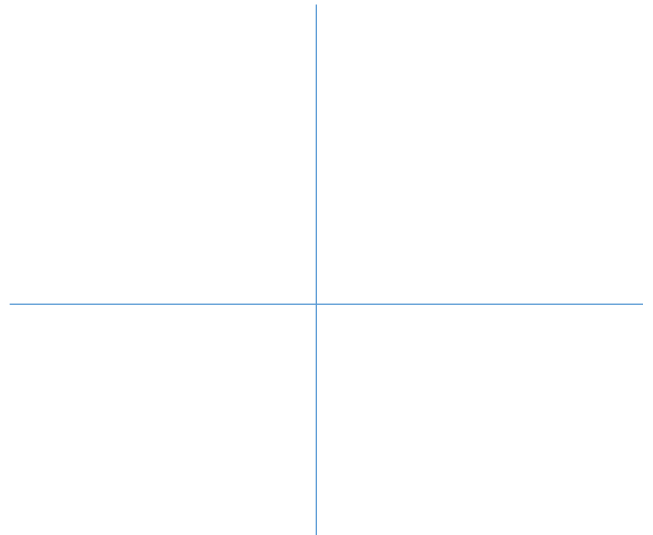
26. (6 pts) Graph $f(x) = \begin{cases} -4x - 12 & x < -2 \\ (x + 2)^2 + 5 & x \geq -2 \end{cases}$

and give the

x-intercept (as a point):

y-intercept (as a point):

and label these points on the graph

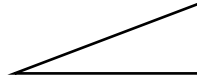


27. (2 pts) Compute the inverse, $f^{-1}(x)$, of $f(x) = x^3 - 10$

28. (4 pts) Solve the equation: $\frac{x}{x-4} + \frac{2}{x+1} = \frac{x^2}{x^2 - 3x - 4}$

For #29-33 use the information $\tan(\theta) = \frac{1}{4}$ and $\sin(\theta) > 0$. Simplify your answers and rationalize the denominators.

29. (3 pts) Label the sides of the triangle:



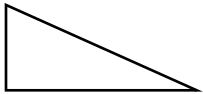
30. (1 pt) Compute the value of $\sec(\theta)$

31. (1 pt) Compute the value of $\sin(\theta)$

32. (2 pts) Compute the value of $\cos(2\theta)$

33. (2 pts) Compute the value of $\tan\left(\frac{1}{2}\theta\right)$

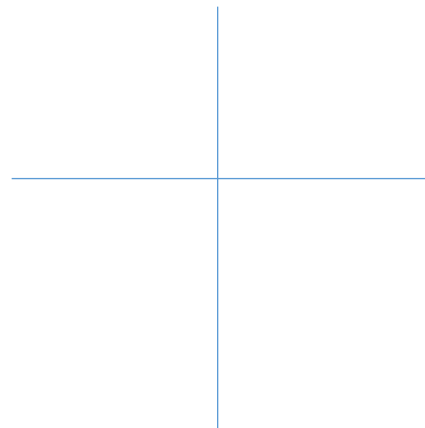
34. (3 pts) From a boat on a lake, the angle of elevation to the top of a cliff is 30 degrees. If the base of the cliff is 600 feet from the boat, compute the height, h , of the cliff.



35. (2 pts) Write the equation of the circle in standard form that has center $(5, -9)$ and has radius 11.

36. (4 pts) Find all solutions to the equation $\sin^2(x) - 2\sin(x) - 3 = 0$

37. (4 pts) Sketch the graph of $f(x) = (x+5)^2(x-3)$, labeling the x -intercepts and y -intercepts.



38. (3 pts) For $f(x) = -2\cos\left(\frac{1}{4}\left(x - \frac{\pi}{6}\right)\right)$, find the

Amplitude:

Period:

Phase Shift:

39. (4 pts) Label each graph with the letter corresponding to one of :

A. \sqrt{x}

B. $\cos(x)$

C. $\ln(x)$

D. e^x

E. $\frac{1}{x}$

F. $\sin(x)$

