

Greetings AP Calculus AB students and parents!

We are embarking on a fascinating journey of developing skills with major concepts and tools for doing calculations with dynamic data.

This message contains three important things to note and act on as necessary:

1. Textbooks: As with many of the AP courses; students must acquire a textbook for this course. Every student must have a textbook (a College Board requirement). I believe some have already acquired a textbook from a previous student in the course. The good news is that I have a supply of donated books that will provide for everyone else that needs one. Let me know by return email that you will need to check one out and I will reserve one for you.
2. Graphing calculators: Each student must have a graphing calculator. Here are the two options:
 - a) purchase a TI 84 CE (or, without the CE – color enhanced)
 - b) check out one of the school's older TI 83 calculators for the year
If you want to use a school calculator - let me know that by return email; they will be reserved in order of request – better ones first.
3. The Summer Project is attached. Due date is Aug 8. It is a quiz grade.

I am looking forward to journeying with you in this course through your senior year!

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AP Calculus AB Summer Assignment for 2022-2023

The time has come to begin the AP Calculus journey! Going into AP Calculus, it is important to be proficient with math skills learned in previous courses. This proficiency sets a foundation for success in the course and on the AP Exam. This packet is designed for you to review/relearn these topics so that you will be ready to learn calculus.

This packet contains a brief review of many math procedures. If you do not fully understand the topics in this packet, it is possible that you could get calculus problems wrong because of the algebra or trig mistakes and not because you do not understand the calculus. Work thoroughly to understand these problems because you will need to be proficient with all of these topics.

You **will have a test one week into the course that covers math/Precalculus review concepts**. We will go over the packet and do additional review the first few days back, but cannot reteach every concept. It is important to practice/relearn these procedures and be ready to forge forth when school begins.

Also, there is a set of 21 facts/formulas, etc. of important Precalculus, Geometry, and Algebra items posted on Quizlet for you to review (some would be useful while doing this packet). Search for “King’s Calculus Precalc Review.” **There will be a quiz over the material on Quizlet the 3rd day of class** – review it ahead of time.

For this packet (on following pages):

- Show all work on separate paper – neatly and easy to read.
- Circle or box the answers clearly.
- Work is due to me or the SFCA office by Monday, Aug 8, 1:00 PM.
- **This packet is a Quiz grade.**

For help:

- Google or youtube the kind of work you need help with.
- After exhausting all else – email me with question numbers you have trouble with; I will provide some guidance.

Enjoy your Summer! I eagerly anticipate journeying with you through your senior year!

Mr. Falde

Write the equation of the following lines in slope-intercept form or point-slope form.

- The line through the points (2, 4) and (4, -5).
- The line with slope 3 passing through the point (4, -2).
- The line perpendicular to $2x - 4y = 8$ passing through the point (1, -2).

Simplify the following:

4. $\frac{x^3}{x^{-5}}$

5. $\frac{2x^3}{y^{-3}} \cdot \frac{y^2}{3x^7}$

6. $\frac{x^2 - 4x - 5}{x^2 + 2x + 1}$

7. $\frac{x-4}{4-x}$

8. $(x-1)^3$

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

Solve the following for all real values of x .

10. $\frac{2}{x+1} = \frac{x-2}{2}$

11. $x^2 - 9x + 9 = 0$

12. $\frac{1}{x} + x = 4$

13. $\frac{5}{e^x + 1} = 1$

14. $\sqrt{x-1} - \frac{5}{\sqrt{x-1}} = 0$

Trigonometry Review

15. A 20 foot ladder rests against a building 15 feet from the floor. How far does the ladder extend from the base of the wall? What angle does the ladder make with the ground?

Solve the following for the principal values of the indicated variable.

16. $3\cos x - 1 = 2$

17. $2\sin(2x) - \sqrt{3} = 0$

18. $\tan^2 x - 1 = 0$

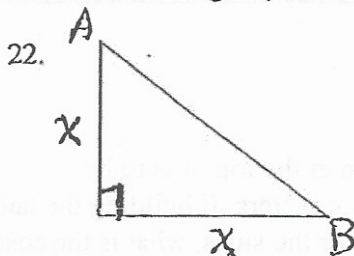
Complete the following trig identities.

19. $\sin^2 x + \cos^2 x =$

20. $\frac{1}{\sin x} =$

21. $\tan^2 x + 1 =$

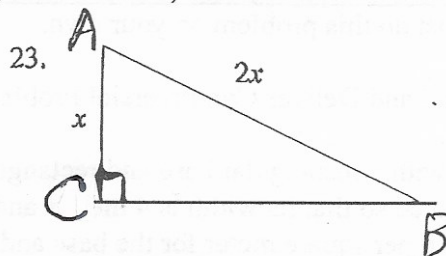
Solve each triangle. (Find the lengths of all sides, in terms of x , and the measures of all angles in degrees.)



$AB =$

$m\angle A =$

$m\angle B =$

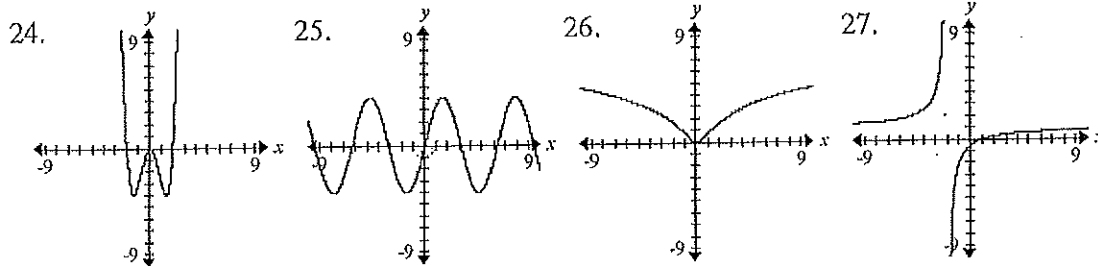


$CB =$

$m\angle A =$

$m\angle B =$

Determine whether the functions, whose graphs are pictured below, represent even functions, odd functions or neither.



Find the average rate of change for the following functions on the indicated intervals.

28. $f(x) = x^3 - 2x$; $[0, 4]$

29. $f(x) = 3\sqrt{x}$; $[4, 25]$

30. A car travels 360 miles in a period of 180 minutes. Find the average velocity of the car in miles per hour over this time period.

31. In 1984, the Fizzy Cola Company sold 23 million gallons of soda. By 2003, the company was selling 127 million gallons of soda. What is the average rate of change in the number of gallons of soda per year?

32. During a recent trip to the store, a car's velocity went from 0 to 60 mph in 20 seconds. What is the average acceleration of the car in miles per hour per hour?

Factor as indicated,

33. $3x^4 + 4x^3 - x^2 = x^2(\quad)$

34. $2\sqrt{x} + 6x^{3/2} = 2\sqrt{x}(\quad)$

35. $\frac{1}{2x^2 + 4x} = \frac{1}{2x}(\quad)$

36. $\sin x + \tan x = \sin x(\quad)$

37. $\sqrt{x^2 + 1} - \frac{x^2}{\sqrt{x^2 + 1}} = \frac{1}{\sqrt{x^2 + 1}}(\quad)$

38. $(2x + 1)^{3/2} x^{1/2} + (2x + 1)^{5/2} x^{-1/2} = (2x + 1)^{3/2} x^{-1/2}(\quad)$

39. $2x^2 + 5x - 3 = (\quad)(\quad)$

40. $e^{2x} + 2 + e^{-2x} = (\quad)(\quad)$

Simplify each expression.

41. $\frac{x^{1/2} - x^{1/3}}{x^{1/6}}$

42. $\frac{1 - (\sin x + \cos x)^2}{2 \sin x}$

Solve for the indicated variable.

43. $x^4 - 4x^2 + 2 = 0$; x^2

44. $\cos^2 x + 3 \cos x + 2 = 0$; x

Use synthetic division to factor.

45. $x^4 - 3x^3 + x^2 + x + 2 = (x - 2)(\quad)$

46. $4x^4 + 3x^2 - 1 = (2x - 1)(\quad)$

Factor completely.

47. $x^4 - 25$

48. $x^3 + 6x^2 + 12x + 8$

49. $x^3 + 4x^2 - 2x - 8$

50. $5 \cos^2 x - 5 \sin^2 x + \cos x + \sin x$