

This is due on the first day of class!

This packet is to help you review topics that are considered to be prerequisite knowledge upon entering AA SL yr 1. To ensure that the good skills you developed in the past year(s) do not disappear this summer, working on this packet is a requirement to be completed over the summer. It is **NOT** recommended to complete immediately following school dismissal in June or the night before the packet is due. Student learning is most effective if the packet is completed over the months of July and August. IB AA SLyr.1 students will be tested on the materials covered in this packet within the first few weeks of school once the teacher has discussed the packet in the classroom.

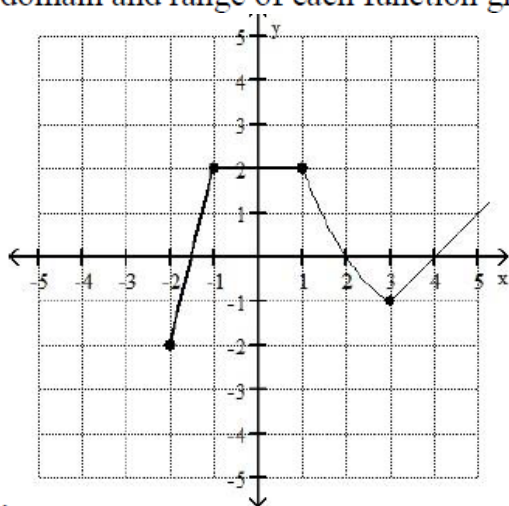
Please **SHOW ALL THE WORK** in the space provided or on another sheet of paper (work is to be done in **Black** or **Blue** pen except graphs and drawings which are to be done in pencil). Be sure to circle your answers and show your work fully to receive credit. The IB AA SL exam has both a calculator and non-calculator portion so read the directions carefully in this packet. If using a calculator, we prefer a TI-84 graphing display calculator (GDC) as that is what we will be teaching with in the fall. If you need help with any of the topics, check out online resources like Khan Academy or YouTube.

Part I: Functions

Given the functions $f(x) = x^2 + 1$ and $g(x) = 2x - 1$, find: (simplify your answer)

1. $(f + g)(-2)$ _____.
2. $(f - g)(3)$ _____.
3. $f(g(x))$ _____.
4. $g(f(1))$ _____.

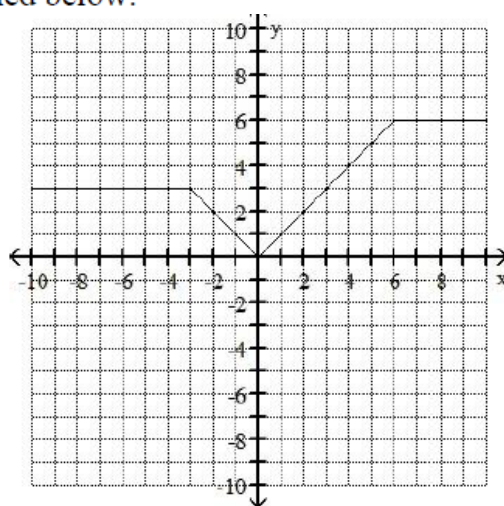
State the domain and range of each function graphed below:



5.

Domain: _____

Range: _____



6.

Domain: _____

Range: _____

7. Find the vertex and y-intercept: $y = 3x^2 - 12x + 13$ _____.

8. Find the inverse: $f(x) = 4x + 20$ _____.

Given: $f(x) = \frac{(2x-6)(x+1)}{(x-1)(x+2)}$

9. Find the vertical asymptotes: _____.

10. Find the horizontal asymptote: _____.

11. Find the relative maximum, relative minimum and the x-and y-intercepts of
 $(x + 1)(2x - 3)(x + 3) = 0$.

11. relative maximum(nearest tenth) _____.

12. relative minimum(nearest tenth) _____.

13. x-intercepts _____.

14. y-intercept _____.

Part II: Simplifying Expressions (no negative exponents) - non-calculator portion.

15. $x^{-3}(x^5 + x^3)$

16. $(2x^6)^2$

17. $\frac{2xy^6z^{-2}}{8xyz^8}$

18. $\frac{x^2 - 4}{x + 5} \cdot \frac{3x^2 + 15x}{x^2 - x - 6}$

19. $(3x - 1)^2$

20. $\frac{x+4}{x+3} + \frac{1}{x-3}$

21. $(4^{2/3})(4^{4/3})$

22. $\frac{\frac{3}{x+1}}{1 - \frac{1}{x+1}}$

23. $\left(\frac{9}{25}\right)^{1/2}$

24. $(2x-1)(2x+1)$

25. $\sqrt[5]{4^{2/5}}$

26. $\frac{2n^2 - 4n}{2n^2}$

Part III: Equation Solving - non-calculator portion except problem 38.

27. $(x-12)^2 = 18$

(answer in simplest radical form)

28. $\frac{20-x}{x} = x$

29. $\sqrt{x-10} - 4 = 0$

30. $2x^2 = 5x + 3$

31. $2x^2 - 4x + 3 = 0$

(answer in radical form)

32. $\frac{1}{x-2} + \frac{3}{x+3} = \frac{4}{x^2 + x - 6}$

33. $\log_2 8 = x$

34. $5^x = 625$

35. $4^x = 2^5$

36. $\log_2 x = 5$

37. $3^{2x} = 27^{x-1}$

38. $2^x = 15$
(nearest tenth)

39. $\log 4 + \log x = 2$

40. $\frac{2}{x+3} - \frac{1}{x} = \frac{-6}{x(x+3)}$

Part IV: Review of Trig

Trig Formulas:

$$a^2 + b^2 = c^2$$

$$\sin \theta = \frac{y}{r} \quad \cos \theta = \frac{x}{r}$$

$$\tan \theta = \frac{y}{x}$$

$$\text{Law of Sines: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

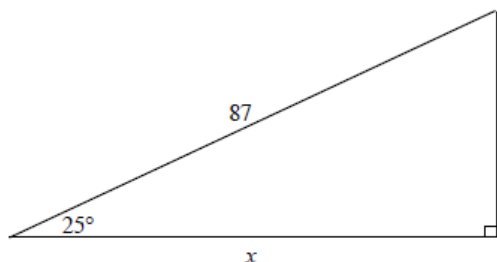
$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$\text{Law of Cosines: } b^2 = a^2 + c^2 - 2ac \cos B$$

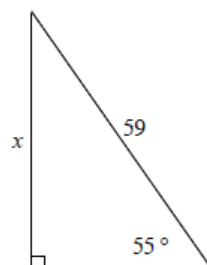
$$a^2 = b^2 + c^2 - 2bc \cos A$$

Solve for x (nearest tenth) or θ (nearest degree): (Calculator must be in degree mode.)

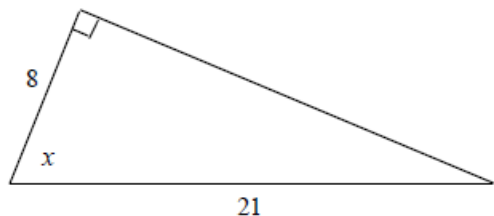
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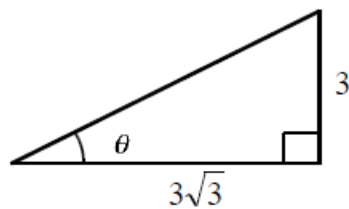
42.



43.



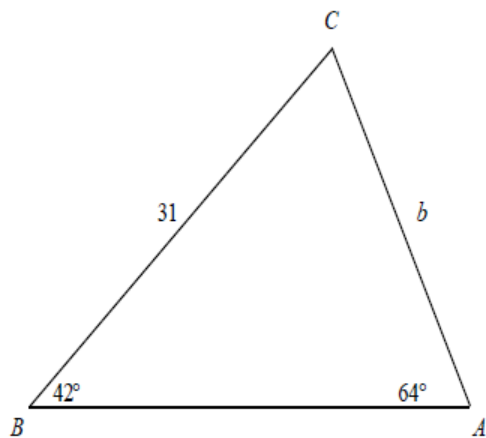
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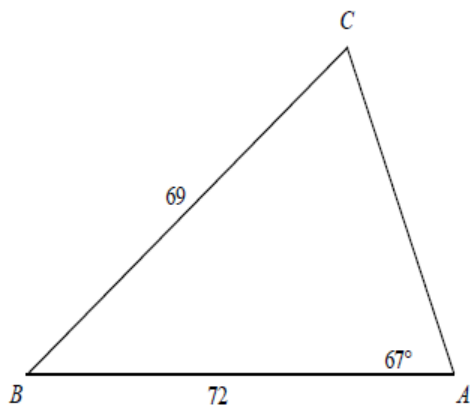
45. From the top of a building that is 56 feet high, the angle of depression to the base of an adjacent building is 72° . Find, to the nearest foot, the distance between the buildings.

46. A ramp that is 12 feet long is used to reach a doorway that is 3.5 feet above the level ground. Find, to the nearest degree, the measure of the angle that the ramp makes with the ground.

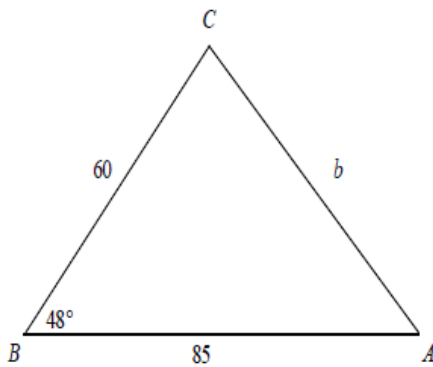
47. Use the Law of Sines to find b to the nearest tenth.



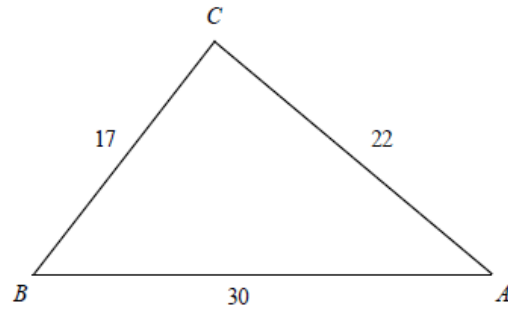
48. Use the Law of Sines to find the measure of $\angle C$ to the nearest degree.



49. Use the Law of Cosines to find b to the nearest tenth.



50. Use the Law of cosines to find the measure of $\angle A$ to the nearest degree.



Part V: Quadratics - non-calculator portion unless stated otherwise.

Factor each quadratic if the quadratic cannot be factored write "prime".

51. $x^2 - x - 2$

52. $x^2 + 3x - 4$

53. $8x^2 - 50y^2$

54. $3x^2 - 5x + 2$

55. $2x^2 - x - 6$

56. $x^3 - 3x^2 - 18x$

Solve each equation using any method except graphing or guess and check.

57. $x^2 + 25 = 10x$

58. $x^2 + 3x - 1 = 0$

59. $x + \frac{12}{x} = 7$

60. $x^2 + 2 = 9$

61. $x^2 - 5x = 0$

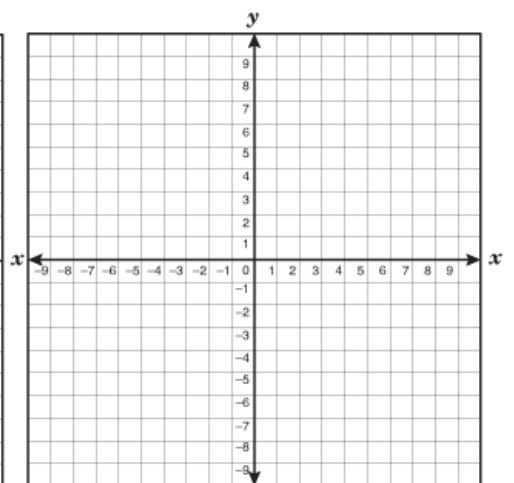
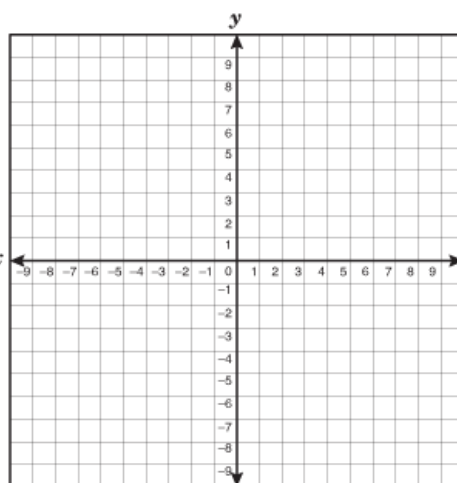
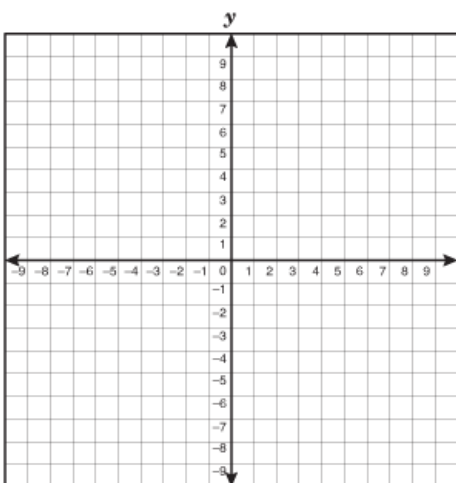
62. $36x^2 - 25 = 0$

State the following for each of the given equations: axis of symmetry, vertex, direction of opening, x- intercepts, and y-intercepts. Then sketch the graph using that information.

63. $y = -2(x + 2)(x - 1)$

64. $y = 0.5(x - 2)^2 - 4$

65. $y = 2x^2 + 6x - 3$



Find the values of p such that the equations below have the given characteristics. (Hint: use the discriminant)

66. Two different real roots

$$px^2 + 5x + 2 = 0$$

67. Two equal real roots

$$2x^2 - 3x + p = 0$$

68. No real roots

$$px^2 - 4px + 5 - p = 0$$

Use your graphing calculator to find the following.

69. Solve $3x^2 - x - 5 = 0$

70. Intersecting points of $y = -x^2 - 5x + 3$ and

$$y = x^2 + 3x + 11$$