

Name _____

This is the summer review packet for students entering Precalculus.

Review packets are designed to help you prepare for your next math class.

Basic Instructions:

- Start review packets 2 weeks prior to the start of the school year.
- Spend approximately 30 minutes per day – working through the packet.
- Expect to turn in the completed packet on the first day of class.
- An answer key is provided, however, ensure your work is shown to receive full credit.
- You may write your answer directly on this sheet or staple additional work to this packet.
- You may use your Algebra 2 notes or borrow an Algebra 2 text from the library if you need to look something up.

Remember: This packet is for your benefit and is intended to help you succeed as you move through more advanced math classes.

Solve the following equations:

1. $\frac{x}{5} + \frac{2}{3} = \frac{2x}{5} - \frac{1}{3}$

2. $6x - 3 = -4(2x + 5) + 45$

3. $x - 5 + 4 = 3(2 - x)$

4. $-x + 6 > 5x - 12$

5. $-10 < 3x + 2 < 8$

6. $|3x + 3| > 9$

7. $|4x - 5| \leq 5$

8. $|4n + 7| = 1$

Graph the following equations. Label the intercepts.

9. $2x - y = 7$

10. $5x - 4y = -2$

Write an equation of a line using the given information.

11. The line that passes through the point $(2, -4)$ and has a slope of $\frac{2}{5}$.

12. The line passing through $(2, -1)$, which is perpendicular to the line $y = \frac{2}{3}x + 5$.

13. The line passing through $(3, 8)$ and $(5, 10)$,

Solve the following equations:

14.
$$\begin{cases} 6x - 2y = 6 \\ 9x + 3y = 15 \end{cases}$$

15.
$$\begin{cases} x - 3y = 5 \\ -2x + 2y = -6 \end{cases}$$

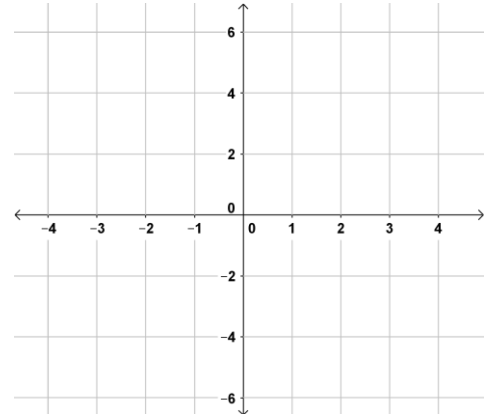
Write an equation of a line using the given information.

16. Solve the quadratic equation $x^2 + 4x = -2$, by completing the square.

17. Use an inverse matrix to solve the following linear system:

$$\begin{cases} 2x + 3y = -8 \\ x + 2y = -3 \end{cases}$$

18. Graph the quadratic equation $y = 2x^2 + 7x + 3$. Label the intercepts and the vertex.



Solve the following quadratic equations by factoring, completing the square or using the quadratic formula. Leave irrational solutions in the form of radicals.

19. $2x^2 + 5 = 11$

20. $3x^2 - 13x - 10 = 0$

21. $2x^2 + x - 5 = 0$

22. $2x^2 + 4x = x^2 - 1$

Factor the following completely.

23. $x^3 - 125$

24. $16x^4 - 1$

25. $6x^5 + 15x^3 + 6x$

26. $3x^7 - 48x^3$

Simplify the following expressions.

27. $(2xy^2)^3$

28. $\frac{25x^3y^2}{-5xy}$

Perform the indicated operations.

29. $(x + 1)(x^2 - x + 1)$

30. $(x^3 - 7x + 6) \div (x - 2)$

Solve the following equations.

31. $x^4 - 13x^2 + 36 = 0$

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

Find all of the zeros of each function.

33. $f(x) = 2x^2 + 9x + 10$

34. $f(x) = x^3 + x^2 - 10x + 8$

35. Solve the inequality: $2x^2 - 4x > 0$.

36. Write the polynomial function of least degree with zeros of -4, -1, 3, that has 1 as its leading coefficient.

Simplify the following expressions.

37. $\frac{15}{\sqrt{5}}$

38. $\sqrt[6]{64}$

39. $(-27)^{-\frac{2}{3}}$

40. $\frac{12}{\sqrt{7}-2}$

41. Find the domain and range of the function: $y = \sqrt{x+3} - 2$.

Solve the following expressions. Check for any extraneous roots.

42. $x^{\frac{3}{2}} = 125$

43. $2\sqrt{3x+1} + 1 = 11$

44. Express $3^{-2} = \frac{1}{9}$ in logarithmic form.

45. Write $\log_5 125 = 3$ in exponential form.

Evaluate without the use of a calculator.

46. $\log_3 81$

47. $\ln e^3$

48. $\log_{12} 1$

49. $\log_2 \left(\frac{1}{4}\right)$

Solve the following equations.

50. $\log_2 x = 4$

51. $2e^x - 1 = 9$

52. $10^{4x-1} = 1000$

53. $\log_2 2x + 10 - \log_2 x - 7 = 3$

54. The value of a new car purchased for \$20,000 decreases by 10% each year. Write an exponential decay model to represent the value of the car. Use this model to estimate the value of the car after 2 years.

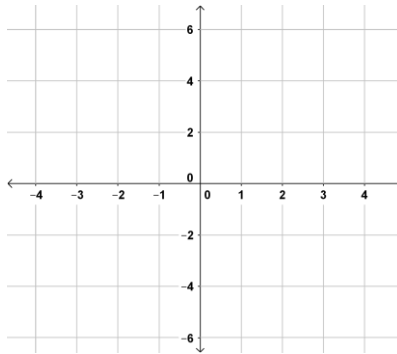
Find the inverse functions.

55. $y = (x - 1)^3 - 2$

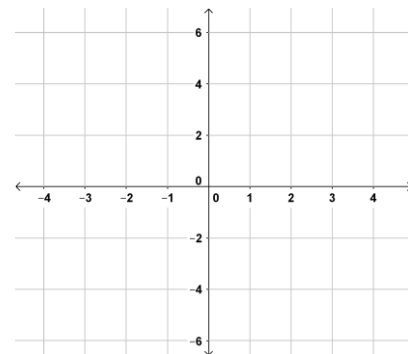
56. $y = \ln(x + 5)$

Graph the functions. State the domain and range.

57. $y = \frac{5}{x}$



58. $y = \frac{x+3}{x+2}$



59. For the points $(5,4)$ and $(7,8)$, find the distance between the points and find the midpoint of the segment.

Solve triangle ABC using the given measurements.

60. $A = 46^\circ, C = 90^\circ, b = 8$

61. $B = 24^\circ, C = 90^\circ, c = 13$

62. $A = 30^\circ, C = 90^\circ, a = 18$

63. $A = 45^\circ, C = 90^\circ, c = 12$

37. $3\sqrt{5}$

38. 2

39. $x = \frac{1}{9}$

40. $x = 4\sqrt{7} + 8$

41. $D: x \geq -3, R: y \geq -2$

42. 25

43. 8

44. $\log_3\left(\frac{1}{9}\right) = -2$

45. $5^3 = 125$

46. 4

47. 3

48. 0

49. -2

50. $x = 16$

51. $x = \ln 5 \approx 1.61$

52. $x = 1$

53. $x = 11$

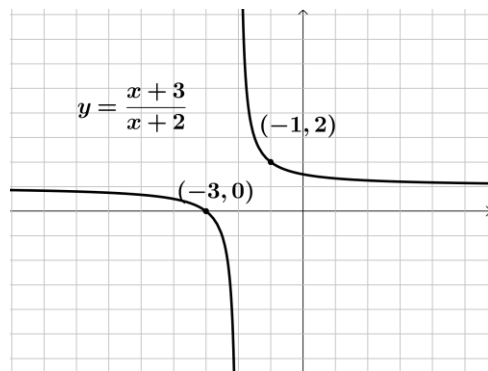
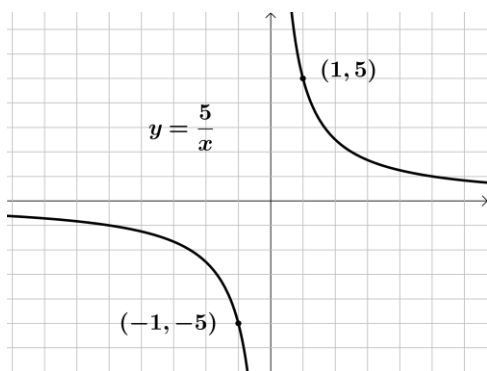
54. $V = 20,000(0.9)^t$, V - value in dollars, t - time in years, 16,200 dollars

55. $y = \sqrt[3]{x+2} + 1$

56. $2 \quad y = e^x - 5$

57. $D: x \in \mathbb{R}, x \neq 0, R: y \in \mathbb{R}, y \neq 0$

58. $D: x \in \mathbb{R}, x \neq -2, R: y \in \mathbb{R}, y \neq 1$



59. Distance = $2\sqrt{5}$, Midpoint = (6, 6)

60. $\angle B = 44^\circ$, $a = 8.28$, $c = 11.51$

61. $\angle A = 66^\circ$, $a = 11.9$, $b = 5.3$

62. $\angle B = 60^\circ$, $b = 18\sqrt{3}$, $c = 36$

63. $\angle B = 45^\circ$, $a = b = 6\sqrt{2}$