King School
PreCalculus Summer Assignment 2025

Name: _____ Date: _____

Directions: Answer each of the following questions to the best of your ability. Make sure to show work to support each answer and circle your final answer for each question. Work neatly and try to show all of your work on the packet itself.

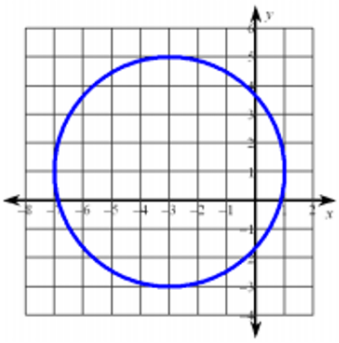
You will be quizzed on this material during the first or second week of school so please take your time. You may use the Internet to look up a topic, but you cannot use the Internet/PhotoMath/ChatGPT or similar platforms to answer specific questions. Feel free to email Mrs. Sheehan with questions if you have any! See everyone in September!

I. Find the equation of a line in slope-intercept form given the following information:

1. Through points $(5,-1)$ and $(0,4)$	2. Slope of $\frac{3}{2}$ and passes through $(2,4)$
3. Through $(-1,-1)$ and parallel to $y=-x-5$	4. Through $(5,-3)$ and perpendicular to $y=\frac{5}{2}x$

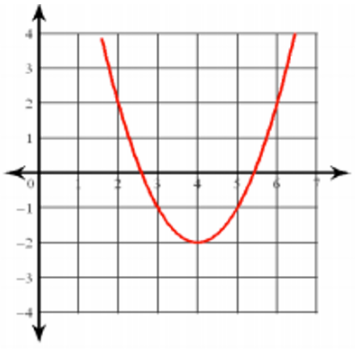
II. State the domain and range of the following relations:

a.



Domain: _____ Range: _____

b.



Domain: _____ Range: _____

c. $\{(-2,3),(-1,0),(-4,5),(1,5),(2,7)\}$

Domain: _____ Range: _____

d. $x=-2$

Domain: _____ Range: _____

III. Evaluate each function
If $f(a) = a^2 - 3a + 6$, find:

a. $f(-3)$ b. $f\left(\frac{1}{2}\right)$ c. $f(4b)$

IV. Given the equation $f(x) = (x + 2)^2 - 1$, find:

1. Vertex: _____
2. Axis of Symmetry: _____
3. Direction: _____
4. Max or Min value:_____
5. x −intercept:_____
6. y −intercept:_____

V. Solving equations and simplifying expressions

For 1-3, solve for x by factoring.

1. $x^2 - x - 20 = 0$

2. $4x^2 - 8x + 3 = 0$

3. $x(3x - 7) = 6$

For 4 and 5, solve for x by taking square roots.

4. $4x^2 = 25$

5. $3(x + 4)^2 = 8$

For 6 and 7 solve each absolute value equation.

6. $2|x - 5| + 10 = 80$

7. $3 - 4|7 - 2x| = 19$

For $8 - 12$, simplify and write each answer in $a + bi$ form.

8. $(1 - i)(2 + 3i)$

9. $(1 - 2i) + (5i + 6) - (7i - 19)$

10. $\frac{4+i}{7i-1}$

11. $(3+4i)^2$

12. $\frac{5-i}{2i}$

For #13-18, simplify each radical expression.

13. $\sqrt{288}$

14. $\sqrt{2x^3y^4}$

15. $\sqrt[4]{16x^8y^6}$

16. $\sqrt[3]{96x^{10}y^{16}z^3}$

17. $\sqrt{\frac{x^5}{y^2}}$

18. $\frac{4}{\sqrt{10}}$

For #19-21, find the product of each.

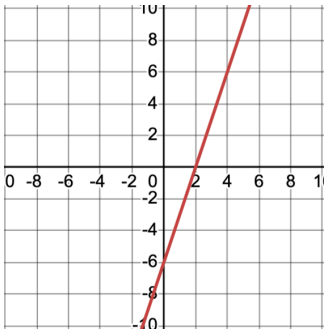
19. $(4x + 1)(2x - 5)$

20. $(3x - 5)(4x^2 - x + 1)$

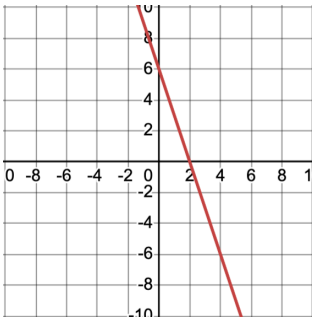
21. $(4x + y - 10)(15 - 6x + 7y)$

22. Pick the graph which represents the graph of the line $-3x - y = 6$

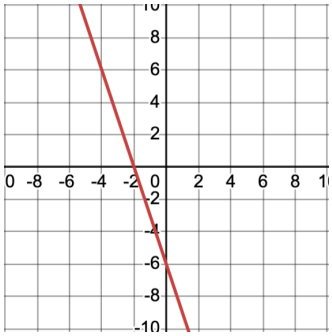
a.



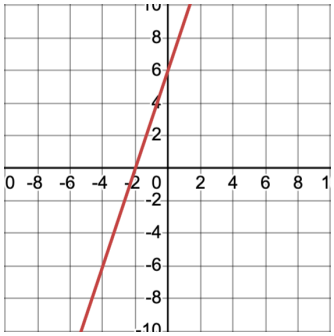
b.



c.



d.



23. Solve the following system of equations using substitution method.

$$\begin{cases} x - y = 10 \\ -3x = 5y - 19 \end{cases}$$

24. Solve the equation $\sqrt{x + 10} - 7 = -5$

25. Multiply and simplify, if possible: $\sqrt{7x}\left(\sqrt{x} - 7\sqrt{7}\right)$

a. $x\sqrt{7} - 49\sqrt{x}$
b. $\sqrt{7x} - 49x$
c. $x\sqrt{7} - x\sqrt{49}$
d. $-\sqrt{42x}$

26. Rationalize the expression $\dfrac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$

a. $\frac{-1-2\sqrt{18}}{3}$
b. $-3 + 2\sqrt{2}$
c. $\frac{-3-2\sqrt{18}}{9}$
d. $9 - 2\sqrt{18}$

27. Simplify $-\sqrt{5} - 3\sqrt{36} + 6\sqrt{5}$

a. $5\sqrt{5} - 18$
b. $5\sqrt{5} - 3\sqrt{36}$
c. $-5\sqrt{5} - 18$
d. None of these

28. Simplify $\left(-4 + \sqrt{3}\right)^2$

29. Draw a sketch of $-150°$ in standard position

30. In which quadrant does the terminal side of a $118°$ angle lie?
    a. I b. II c. III d. IV e. None of these

31. Convert $320°$ to radian measure

32. Convert $-\frac{3\pi}{5}$ to degree measure

33. Write the equation of a quadratic function, in vertex form, that passes through the point $(-2,3)$ and has a vertex of $(7,-4)$

For 34-35, solve and graph your solution on a number line

34. $3x^2 - 13x - 10 \geq 0$

35. $\frac{7x-2}{4x+3} < 9$

For 36-37, solve each equation for x. Check for any extraneous solutions

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

37. $\frac{x}{x-1} - \frac{2}{x} = \frac{1}{x-1}$

For 38-41, simplify each expression completely

38. $\frac{8z^3-1}{2z^2+5z-3}$

39. $\frac{y^3+2y^2+4y}{y^3+2y^2} \cdot \frac{y^2-4}{y^3-8}$

40. $\frac{7x-7y}{4y} \div \frac{14x-14y}{3y}$

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

For #42-52, factor each expression completely.

42. $x^3 + x$

44. $16y - y^3$

43. $18y^3 + 48y^2 + 32y$

45. $5y + 3y^2 - 2y^3$

46. $2(5x+1)^2-18$

47. $12x^2+22x-20$

48. $2ac-2bd+4ad-bc$

49. $x^3-3x^2-4x+12$

50. $4y^3-20y^2+25y$

51. $2x^3-16x^2+14x$