Student Name: _____

PreCalculus Summer Packet!School Year 2022-2023

About PreCalculus:

PreCalculus requires students to think, reason, and communicate mathematically. A strong foundation in Algebra and Geometry is critical for success.

Keys to success in PreCalculus:

- Persistence, and the desire to understand rather than memorize.
- Ask for help! Do not suffer in silence!
- Resilience, and ability to "bounce back" from times when you solve a problem incorrectly.
- Curiosity and the interest to know the "why" of mathematics.

Packet Expectations:

The summer packet is your opportunity to demonstrate mastery of Algebra concepts.

- **You are expected to show their work for each problem of this review packet**. Each problem should be worked through to its entirety, and correctly; not just attempted.
- If you cannot print it out, no problem! Use your own paper and stay organized! Number each problem!
- DO NOT WAIT UNTIL THE LAST MINUTE! Start this early!
- The packet will be counted as part of your homework average for first quarter.
- You should be prepared to have the summer packet completed and ready to be checked on the Friday of the first week of school.
- Over the course of the first few weeks of the beginning of the school year, the packet will be reviewed, and an assessment will be given as the first test grade of the new school year.

Supplies needed for PreCalculus:

- 3-ring binder - any size!
- Pencils, pencils, pencils!

Please sign below to show that you understand the required materials and positive attitude to be successful in this course.

_____ _____ _____

Printed Name: _____

Signature: _____ Date: _____

<u>Section I - Student Selected Response (True or False)</u> - Work is REQUIRED to receive credit!

1. True or False: The expression $(2x-3)^2$ simplifies to $4x^2+9$

2. True or False: The expression -6^2 is equivalent to 36

3. True or False: The expression $\sqrt{36+64}$ simplifies to 14

4. True or False: $\sqrt{3}+\sqrt{3}=\sqrt{6}$

5. True or False: $\sqrt{7}\cdot\sqrt{7}=7$

6. True or False: The points $A(-5,7)$ and $A(5,-2)$ are the same distance from the y-axis.

7. True or False: $\dfrac{3}{-2x+1}=\dfrac{-3}{2x-1}$

8. True or False: $\sqrt{81}=\pm 9$

9. True or False: Given that $x>0$ and $y>0$, $\sqrt{x^2+y^2}=x+y$

10. True or False: Given that $x>0$ and $y>0$, $\sqrt{x^2y^2}=xy$

11. True or False: Given that $x>0$, the expression $\sqrt{18x^3}=3x\sqrt{2x}$

12. True or False: The expression $\left(4x^2y^3\right)^0$ is equivalent to zero.

13. True or False: Solving the equation $x^2=100$ results in the solution set $\{10,-10\}$

14. True or False: $\sqrt{(x-5)^2}=|x-5|$

15. True or False: $27^{\frac{2}{3}}=\sqrt[3]{27^2}=\left(\sqrt[3]{27}\right)^2$

16. True or False: $\frac{6\sqrt{10}}{2} = 3\sqrt{5}$

17. True or False: Subtracting $2x-5$ from $8x+7$ results in $6x-2$

18. True or False: Every right triangle has one 90° angle and two acute angles.

19. True or False: The two acute angles in a right triangle are complimentary.

20. True or False: If the hypotenuse in a right triangle has length 13 inches and one leg has length 12 inches, then the other leg has length 5 inches.

21. True or False: $40 \div 10 \cdot 2 = 8$

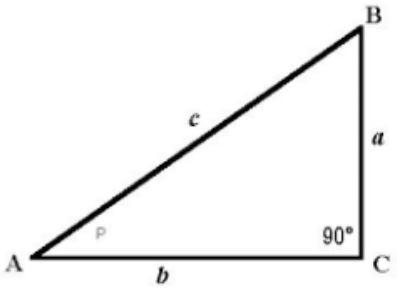
22. True or False: $6-2(5+3)=32$

23. True or False: The expression $(-6)^2$ is equivalent to 36

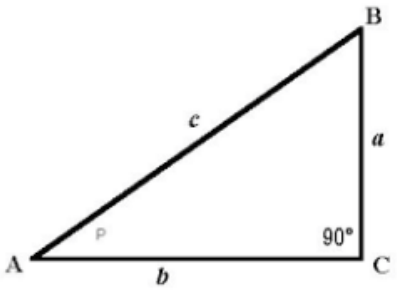
24. True or False: $-2(-3)^2 = 36$

25. True or False: $\frac{6}{0} = 0$

26. True or False: In the right triangle displayed to the right, the leg opposite angle A is side a.



27. True or False: In the right triangle displayed to the right, the leg adjacent to angle A is side b.



<u>Section II - Student Selected Response (Multiple Choice)</u> - Work is REQUIRED to receive credit!

28. Solving $3-2x>11$ results in the solution set

a. $x<-4$ b. $x>-4$ c. $x<4$ d. $x>-7$ e. $x<-7$

29. The radical expression $\sqrt{18x^{16}}$ simplifies to

a. $2x^4\sqrt{3}$ b. $3x^4\sqrt{2}$ c. $2x^8\sqrt{3}$ d. $9x^4\sqrt{2}$ e. $3x^8\sqrt{2}$

30. The radical expression $\sqrt{2}+\sqrt{50}$ simplifies to

a. $\sqrt{52}$ b. $5\sqrt{2}$ c. $2\sqrt{13}$ d. $6\sqrt{2}$ e. $\sqrt{2}+2\sqrt{5}$

31. The expression $3^{\frac{1}{2}}\cdot 3^{\frac{1}{3}}$ simplifies to

a. $9^{\frac{5}{6}}$ b. $3^{\frac{2}{6}}$ c. $9^{\frac{2}{5}}$ d. $9^{\frac{1}{6}}$ e. $3^{\frac{5}{6}}$

32. The rational expression $\dfrac{x^2+16}{x-4}$ is equivalent to

a. $x-4$ b. $x+4$ c. $4x$ d. none of these

33. The rational expression $\dfrac{x^2+5x+14}{x+2}$ is equivalent to

a. $x+2$ b. $x+12$ c. $6x+7$ d. $x+7$ e. none of these

34. The domain of the quadratic function $f(x)=x^2-8x+12$ is

a. $x\geq 12$ b. $x\geq 4$ c. $x\leq -4$ d. $x\geq -4$ e. $(-\infty,\infty)$

35. The range of the quadratic function $f(x)=x^2-8x+12$ is

a. $y\geq 12$ b. $y\geq 4$ c. $y\leq -4$ d. $y\geq -4$ e. $(-\infty,\infty)$

36. If a line has a slope of zero, then the line is

a. vertical b. slant or oblique c. horizontal d. undefined

37. If a line has an undefined slope, then the line is

a. vertical b. non-horizontal/non-vertical c. horizontal d. undefined

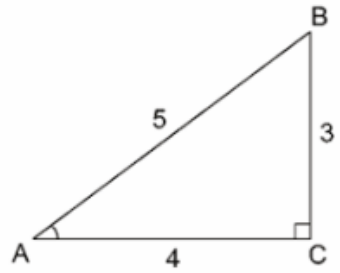
38. Solving the equation $3x-7=5x+9$ results in the solution

a. $x=8$ b. $x=-1$ c. $x=1$ d. $x=-8$ e. $x=2$

39. The binomial x^2+25 factors as

a. $(x+5)(x+5)$ b. $(x-5)(x-5)$ c. $(x+5)(x-5)$ d. does not factor

Refer to triangle ABC below. Determine each of the following trigonometric ratios:



40. $\sin A =$

a. $\frac{4}{5}$ b. $\frac{3}{4}$ c. $\frac{5}{3}$ d. $\frac{5}{4}$ e. $\frac{3}{5}$

41. $\cos B =$

a. $\frac{3}{4}$ b. $\frac{3}{5}$ c. $\frac{5}{4}$ d. $\frac{5}{3}$ e. $\frac{4}{5}$

42. $\tan A =$

a. $\frac{5}{4}$ b. $\frac{3}{5}$ c. $\frac{3}{4}$ d. $\frac{5}{3}$ e. $\frac{4}{5}$

43. The fraction $\frac{8}{2^{-1}}$ is equivalent to

a. 64 b. $\frac{2}{8}$ c. $\frac{8}{2}$ d. 16 e. none of these

44. The graph of the parabola with equation $f(x)=(x-4)^2+6$ has a vertex with coordinates

a. $(-4,6)$ b. $(-4,-6)$ c. $(4,6)$ d. $(4,-6)$

45. The graph of the quadratic function $f(x)=2(x+3)^2-1$ has an axis of symmetry with equation

a. $x=3$ b. $x=-3$ c. $x=2$ d. $x=-1$

46. Solving the compound inequality $-11<3x-8<7$ results in the solution set

a. $-5<x<1$ b. $-1<x<5$ c. $x<-5 \text{ or } x>1$ d. $x<-1 \text{ or } x>5$

47. The point or ordered pair $P(-3,4)$ is located in quadrant

a. I b. II c. III d. IV

48. The point or ordered pair $K(3,-4)$ is located in quadrant

a. I b. II c. III d. IV

49. The slope of the line containing two points $A(-1,4)$ and $B(3,7)$ is

a. $m=\frac{4}{3}$ b. $m=\frac{-4}{3}$ c. $m=\frac{-3}{4}$ d. $m=\frac{3}{4}$

50. Simplifying the algebraic expression $(4xy^4)^3$ results in

a. $4x^3y^{12}$ b. $12x^3y^{12}$ c. $64x^3y^{12}$ d. $64x^4y^7$

51. The absolute value expression $|7-15|$ simplifies to

a. 22 b. -22 c. -8 d. 8

52. The slope of the graph of the linear function $2x-3y=12$ is

a. $\frac{2}{3}$ b. $\frac{-3}{2}$ c. $\frac{-2}{3}$ d. $\frac{3}{2}$

53. Factoring the polynomial $x^2+20x+36$ results in

a. $(x+1)(x+36)$ b. $(x+2)(x+18)$ c. $(x+3)(x+12)$ d. $(x+4)(x+9)$

Student Generated Free Response Section

54. Determine the number that is 17 more than the quotient of 56 and 8.

55. What is the x-coordinate of every point on the y-axis?

56. Write $\frac{101}{15}$ as a mixed number.

57. Divide and reduce $\frac{56}{85}\div\frac{14}{17}$

58. Add and reduce $\frac{11}{30}+\frac{13}{50}$

59. Determine the number that is 11 less than the difference of 37 and -5.

60. Write the coordinates of the y-intercept of the graph of the linear function $f(x)=-2x+8$ Show work neatly.

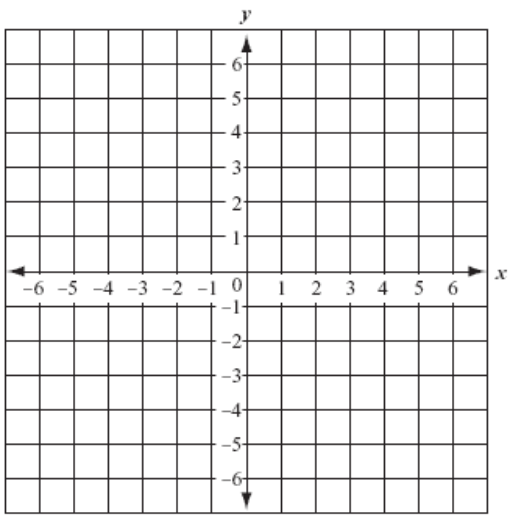
61. Write the coordinates of the x-intercept of the graph of the linear function $f(x)=-2x+8$ Show work neatly.

62. Write the coordinates of the y-intercept of the graph of the linear function $-3x+4y=-8$. Show work neatly.

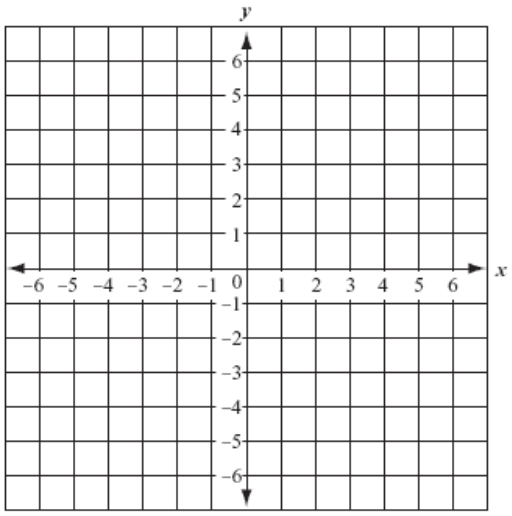
63. Write an equation of the line with slope $m=\frac{-3}{5}$ and y-intercept coordinates $(0,6)$.

64. Write an equation of the line containing the two points $(-6,-11)$ and $(3,4)$.

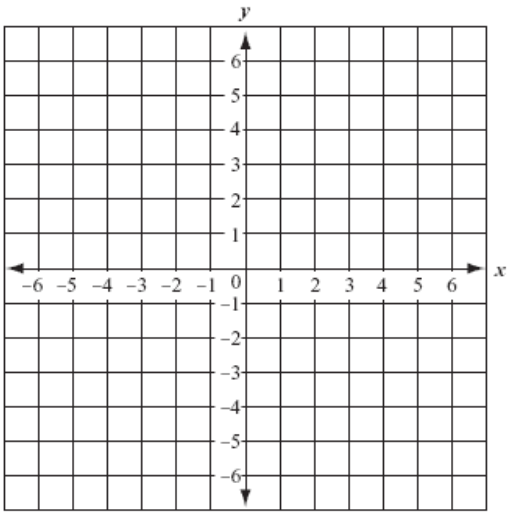
65. Graph the line with equation $y=-2x+3$.



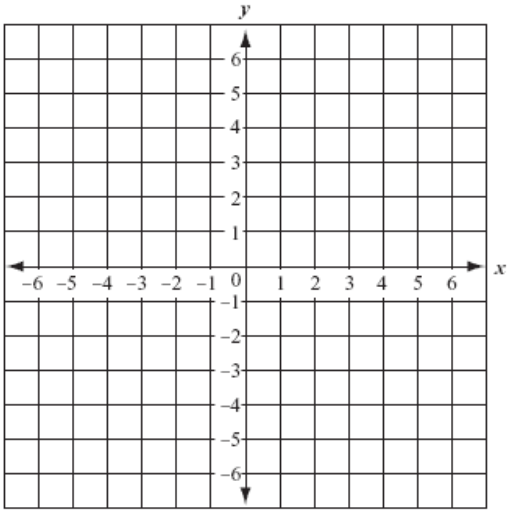
66. Graph the line with equation $5x - 3y = 15$.



67. Graph the line with equation $y = -3$.



68. Graph the line with equation $y = x$.



69. Write the coordinates of the y-intercept of the graph of the quadratic function $f\left(x\right)=x^2-8x+9$. Show work neatly.

70. Convert the quadratic function $f\left(x\right)=2\left(x-3\right)^2-5$ from vertex form to standard form $f\left(x\right)=ax^2+bx+c$.

71. Write the linear equation $y=\frac{5}{3}x-2$ in standard form $ax+by=c$.

72. Simplify the algebraic expression $\left(5xy^3\right)\left(4x^2y^3\right)$

73. Simplify the algebraic expression $9x^2y^3-4x^2y^3$

74. Simplify the algebraic expression $x^3-3x^2+4x-6+3x^3-3x^2-9x+1$

75. Simplify the algebraic expression $\left(x^3-3x^2+4x-6\right)-\left(3x^3-3x^2-9x+1\right)$

76. Simplify the algebraic expression $3\left(2x-1\right)+2\left(4x+5\right)$

77. Simplify the algebraic expression $x^2\left(2x-1\right)+x\left(4x+5\right)$

78. Solve the equation $x^2=100$

79. Solve the equation $x^2+13x+36=0$ by factoring.

80. Solve the equation $x^2-16x-36=0$ by factoring.

81. Solve the equation $x^2-64=0$ by factoring.

82. Use the quadratic formula $x=\dfrac{-b\pm\sqrt{b^2-4ac}}{2a}$ to solve the equation $x^2-6x+4=0$