

Name: _____

Dover High School

CP and Honors Precalculus Summer Work 2017

This packet is a review of the entering objectives for Pre-calculus and are due on the FIRST DAY OF SCHOOL

A graphing calculator is not needed to complete these problems. Answer each and show all work to support your answer. Work is to be done on a separate piece(s) of paper, be organized and easy to read. All answers must be written in the space provided.

If you need assistance with any concept try these resources:

Khan Academy: <https://www.khanacademy.org/>

Math Planet: <http://www.mathplanet.com/>

Online Graphing Calculator: <https://www.desmos.com/calculator>

Have a wonderful summer and we will see you in the fall!

-Mrs. St.Cyr

-Mrs. Hall c.hall@dover.k12.nh.us

Section 1: Short Answer

Write a brief explanation of the meaning of each.

1. $f(2) = 5$

2. The equation is a function.

3. The zeros of a function are -1 and 4 .

4. $f^{-1}(x)$

5. Explain why $(x + 2)^2 \neq x^2 + 4$. What does it equal?

Section 2: Exponents

Simplify each of the following expressions.

6. $6y^2(2y^4)^2$

6. _____

7. $\left(\frac{x^{-3}y^4}{5}\right)^3$

7. _____

8. $(4a^{-2}b^3)^{-3}$

8. _____

9. $36^{\frac{3}{2}}$

9. _____

10. $\left(-\frac{125}{27}\right)^{-\frac{1}{3}}$

10. _____

11. $(3a(4a^3)^{-5})^0$

11. _____

Section 3: Radicals

Simplify each of the following expressions, rationalize where necessary.

- | | |
|-------------------------------------|-----------|
| 12. $\sqrt{288}$ | 12. _____ |
| 13. $\sqrt[3]{24}$ | 13. _____ |
| 14. $3\sqrt{12} + 2\sqrt{300}$ | 14. _____ |
| 15. $\frac{4}{1-\sqrt{5}}$ | 15. _____ |
| 16. $(2\sqrt{5} + 3)(\sqrt{5} - 1)$ | 16. _____ |

Section 4: Factoring

Factor the following completely.

- | | |
|------------------------------|-----------|
| 17. $9x^3y - 25xy^3$ | 17. _____ |
| 18. $x^3 + 7x^2 - 18x$ | 18. _____ |
| 19. $8y^3 + 24y^2 - 7y - 21$ | 19. _____ |
| 20. $27x^3 - 8$ | 20. _____ |
| 21. $2y^3 - 7y^2 - 15y$ | 21. _____ |
| 22. $x^4 - 2x^2 - 8$ | 22. _____ |

Section 5: Solving equations and inequalities.

Solve the following equations.

- | | |
|--|-----------|
| 23. $x^2 + 3x + 2 = 0$ | 23. _____ |
| 24. $2x^2 - 5x = 3$ | 24. _____ |
| 25. $4x - 3x^2 = 2$ | 25. _____ |
| 26. Solve the system: $\begin{cases} 3x - y = -5 \\ 2x + 3y = 4 \end{cases}$ | 26. _____ |
| 27. $\sqrt{x-5} = x + 1$ | 27. _____ |
| 28. $x^3 - 3x^2 + 4x - 12 = 0$ | 28. _____ |

Section 6: Linear Equations

Write the following equations in slope-intercept form: $y = mx + b$.

29. The line containing the point $(4, -7)$ and having a slope of $\frac{5}{2}$. 29. _____
30. The line containing the point $(-13, 5)$ and parallel to $4x + 2y = -7$. 30. _____
31. The line containing the point $(0, -2)$ and perpendicular to $x - 4y = 3$. 31. _____
32. The line containing the point $(2, 9)$ and having an undefined slope. 32. _____
33. The perpendicular bisector of the segment between $(-5, 3)$ and $(12, 3)$. 33. _____

Section 7: Functions

Given that $f(x) = 4x - 1$ and $g(x) = x^2 + 1$, find the following compositions.

34. $(f + g)(x)$ 34. _____
35. $(f \circ g)(x)$ 35. _____
36. $(g - f)(x)$ 36. _____
37. $f(x) \cdot g(x)$ 37. _____
38. $f(g(f(x)))$ 38. _____
39. $f^{-1}(x)$ 39. _____

For the function $f(x) = x^2 - 6x + 8$, find the following.

40. $f(-2)$ 40. _____
41. $f\left(\frac{1}{2}\right)$ 41. _____
42. $f(f(-2))$ 42. _____
43. $f(a + h)$ 43. _____

Section 8: Logarithms and Exponentials

44. Simplify: $\log_3 81$ 44. _____
45. Simplify: $\log_4 \frac{1}{64}$ 45. _____
46. Simplify: $\ln e^{(x+2)}$ 46. _____
47. Expand the logarithm: $\ln \frac{x^2}{z^3 \sqrt{y}}$ 47. _____
48. Condense to a single logarithm: $3 \log_b x - 2 \log_b x$ 48. _____
49. Solve: $\log_x(x+3) + \log_3(x-3) = 4$ 49. _____
50. Solve: $4^{x^2+4x} = \frac{1}{64}$ 50. _____
51. Solve: $5^{1-x} = 8$ 51. _____

Section 9: Polynomial and Synthetic Division

52. $(x^4 + 12x^3 + 38x^2 + 12x - 63) \div (x^2 + 6x + 9)$ 52. _____
53. $(x^6 - 2x^5 + x^4 - x^3 + 3x^2 - x + 24) \div (x + 2)$ 53. _____
54. Find all zeros of: 54. _____
 $p(x) = x^4 - 6x^3 + 20x^2 - 22x - 13$ given that $(2 - 3i)$ is a zero
55. Find all zeros of: 55. _____
 $f(x) = 2x^4 + 5x^3 + 4x^2 + 5x + 2$

Section 10: Graphing

State the transformations of the given function from its parent function.

56. $y = (x - 2)^2 + 4$

56. _____

57. $y = 2\sqrt{-x} - 2$

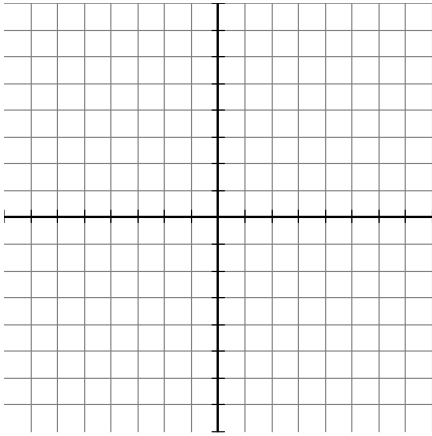
57. _____

58. $y = -\frac{1}{2}|x + 4|$

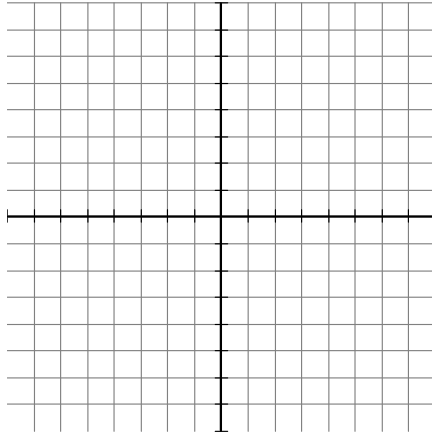
58. _____

Graph each function and clearly indicate units of the axis.

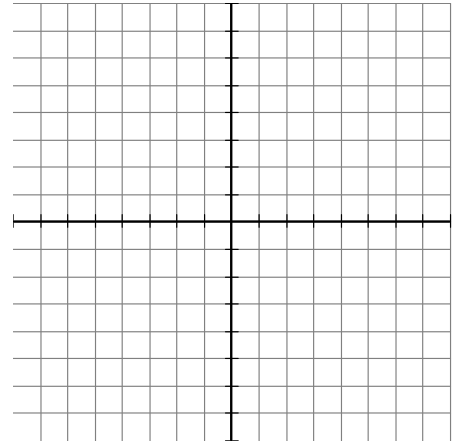
59. $f(x) = x$



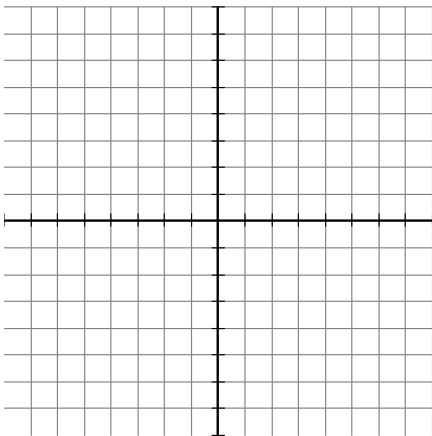
60. $f(x) = x^2$



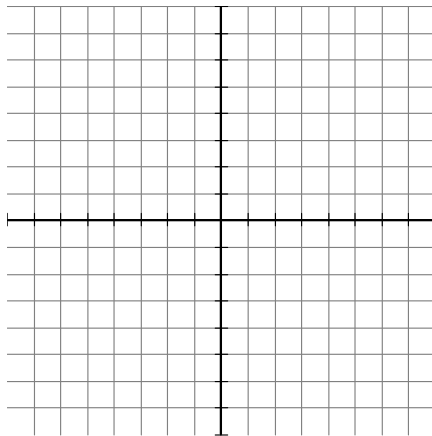
61. $f(x) = x^3$



62. $f(x) = |x|$



63. $f(x) = \sqrt{x}$



64. $f(x) = \frac{1}{x}$

