

DE Precalculus

Summer Assignment 2024

This summer packet is required for all DE Precalculus students. It is expected that you are proficient in this material by the first day of school. Please spend some time this summer practicing and reviewing the Algebra 1 and 2 topics in this packet. If you find that you do not remember a topic, please use the resources listed below to review.

Helpful Hints to Completing the Packet Over the Summer:

- Pace yourself. Plan to do a portion each week. You are not expected to complete it all in one day.
- If available, use your notes from previous classes or the resources online.

Online Resources:

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

Purple Math <https://www.purplemath.com/>

Mathispower4u <http://www.mathispower4u.com/>

Summer Assignment Grade:

- Each problem, with work, counts toward the total homework grade.
- To ensure you complete AND understand the summer assignment, you will have a quiz on this material during the first week of school.

Precalculus Supplies Needed → BE PREPARED

- Pencils/Erasers
- 3 Ring Binder
- Loose-leaf paper
- Graphing Calculator (if you don't already have one, I recommend a TI-84)

Please show all work in the spaces provided. If work is on a separate sheet, clearly enumerate and staple to the back of this packet.

ALGEBRAIC MANIPULATION

1. Solve for x .

2. Solve for m .

$$5x + 3(x - 2) = 4x + 1$$

$$g = 4cm - 3m$$

3. Solve for x .

$$-(1 + 7x) - 6(-7 - x) = 36$$

4. Evaluate 3^{x-y} if $x = 5$ and $y = -3$.

$$3^{(x-y)}$$

5. Multiply $(-x)(-3y)(-5z)$

6. Multiply $(4n - 3)^2$

7. Multiply $(x^2 + x - 3)(3x^2 - x + 3)$

8. Subtract $(-3n^2 + 2n - 9)$ from $(n^2 - 4n - 6)$

OPERATIONS WITH EXPONENTS

9. Simplify $(2x^4)^{-3}$

10. Simplify $(x^{2y})(2x^y)(x^{y+3})$

11. Simplify $\left(\frac{x^3 - 7}{x - 3}\right)$

12. Simplify $\frac{5x^3y^9}{30x^4y^{-2}}$

13. Multiply $\frac{5x^{-3}y^2}{x^5 - 10y} \cdot \frac{(2xy^3)^{-2}}{z - xy}$

14. Simplify $\frac{7a^2b^2}{b} \cdot \frac{35a^2}{18xy^3} \cdot \frac{12x^2y}{12x^2y} \div$

SYSTEMS OF EQUATIONS

15. Solve the system of equations by substitution.

$$\begin{aligned} 8x - 2y &= 10 \\ 3x - y &= 9 \end{aligned}$$

16. Solve the system of equations by elimination.

$$\begin{aligned} 2x - 3y &= 6 \\ 9y - 6x &= 9 \end{aligned}$$

FACTOR COMPLETELY

17. $a^2 - 6a - 40$

18. $49x^2 - 100y^2$

19. $6x^2 + 13x - 5$

20. $3x^3 + x^2 - 15x - 5$

SOLVE EACH EQUATION BY FACTORING

21. $4x^2 - 1 = 0$

22. $x^2 + 3x = 10$

23. $5x^2 - 32x - 21 = 0$

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

25. SOLVE BY COMPLETING THE SQUARE

$$x^2 + 10x - 25 = 0$$

26. SOLVE USING THE QUADRATIC FORMULA

$$2x^2 - 14x + 40 = 3x^2 - 16x + 32$$

OPERATIONS OF RATIONAL EXPRESSIONS

27. Simplify $\frac{6y+30}{y^2-25}$

28. Simplify $\frac{a^2-x^2}{3x-3a} \cdot \frac{a}{a^2}$

$\frac{x^2-16}{x^2-16}$

29. Simplify $x^2+16 \div x^2-4x+16$

30. Simplify $\frac{x^2-xx-20}{x+14} + \frac{x-35}{x-35}$

31. Simplify $\frac{1+\frac{1}{x}}{1-\frac{x}{y}}$

RATIONALIZING THE NUMERATOR/DENOMINATOR & SIMPLIFYING

32. $\frac{3}{\sqrt{5}-\sqrt{6}}$

$3x-66$

33. $\frac{\sqrt{x+3}-5}{\dots}$

OPERATIONS OF COMPLEX NUMBERS

34. $6 - (2 + 9i) + (-1 + 4i)$

35. $(5 - 7i)^2$

36. $\frac{-5-3i}{-4i}$

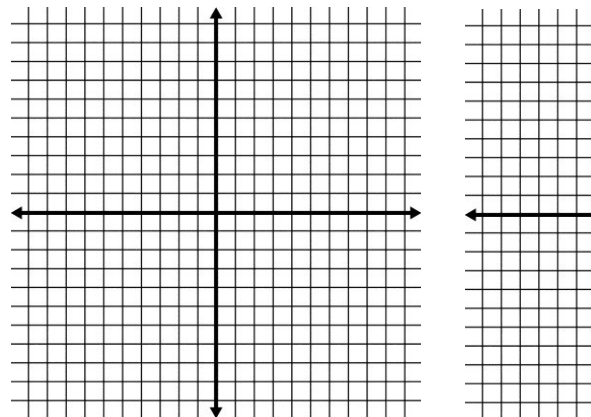
EVALUATING LOGARITHMS

37. $\log_3 81$

38. $\log_5 25^{-1}$

39. $\log 1000$

40. $\ln e$



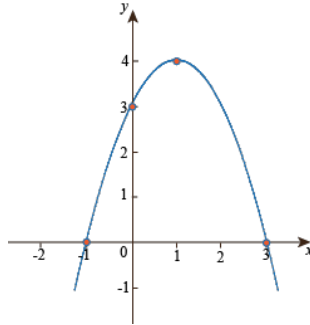
LINES AND COORDINATE GEOMETRY

41. Graph $y = -2x + 4$

42. Graph $x + 3y = 6$

DOMAIN AND RANGE

44. $(1, 2), (-3, 8), (-9, 6), \frac{1}{2}, (, 5)$ 45.



Domain: _____

Domain: _____

Range: _____

Range: _____

43. Determine whether the lines are parallel, perpendicular, or neither. Explain your reasoning.

$$2x + 3y = 12$$

$$3x + 2y = 24$$

FUNCTIONS

47. If $f(x) = -2x^2 + x + 3$, evaluate each of the following:

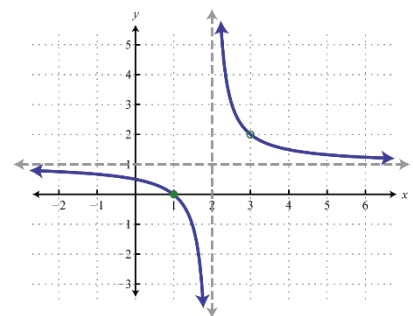
a) $f(-2) =$

b) $f(3m) =$

a) $g(-3) =$

c) $f(p^5) =$
 b) $g(1) =$

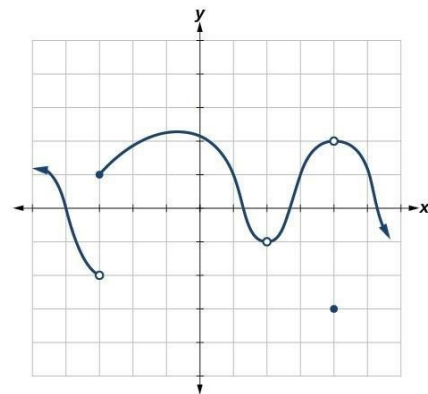
46.



Domain: _____

Range: _____

48. The graph of a function g is given.



- c) Domain:
d) $f(x + h) =$

- e) Find the values of x for which is $g(x) = -1$

49. Evaluate the piecewise defined function at the indicated values.

$$f(x) = \begin{cases} x^2 + 4x, & x \leq -3 \\ x, & -3 < x \leq 1 \\ -9, & x > 1 \end{cases}$$

a) $f(-4) =$

b) $f(1) =$

c) $f(0) =$

d) $f(35) =$