

## 2017 Pre-Calculus Summer Review Packet

This packet of material consists of topics/skills that we expect students to know upon their arrival to the course this fall. All topics have been previously taught in math courses that precede Pre-Calculus Honors. You should be able to complete this without the use of a calculator. If you need clarification on a topic during the summer months, consider consulting an Internet resource, textbook, or your notes from previous math courses.

Although this packet is optional, it is encouraged that all students enrolled in this course are familiar with the concepts.

**Simplify each radical expression.**

1.  $\sqrt[3]{-64}$

2.  $\sqrt{49m^2n^8}$

3.  $\sqrt{\frac{11}{9}}$

4.  $\sqrt{60} \cdot \sqrt{135}$

5.  $(\sqrt{5} - \sqrt{6})(\sqrt{5} + \sqrt{2})$

6.  $\frac{3}{2 - \sqrt{5}}$

**Simplify each expression involving complex numbers.**

9.  $\sqrt{-49}$

10.  $6\sqrt{-12}$

11.  $-6(2 - 8i) + 3(5 + 7i)$

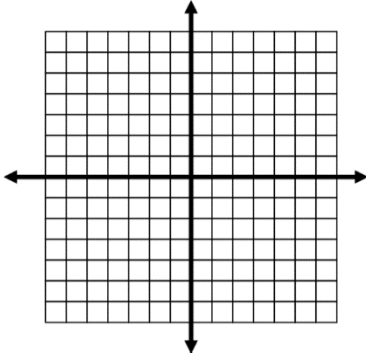
12.  $(3 - 4i)^2$

13.  $(6 - 4i)(6 + 4i)$

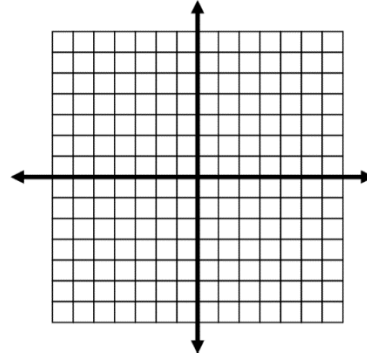
14.  $\frac{1 + 6i}{5i}$

Sketch a graph of each and label at least 2 points on each graph.

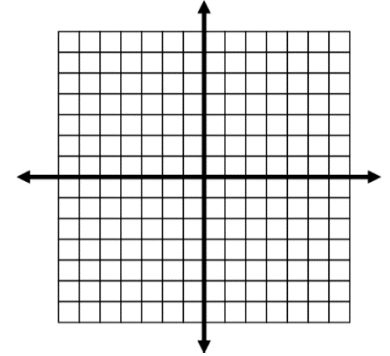
15.  $f(x) = -3x + 5$



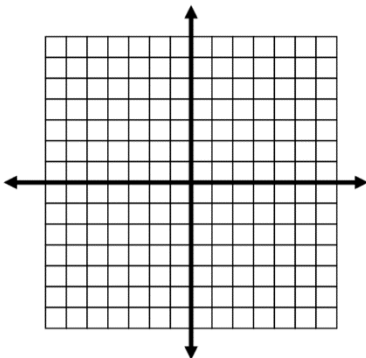
16.  $f(x) = x$



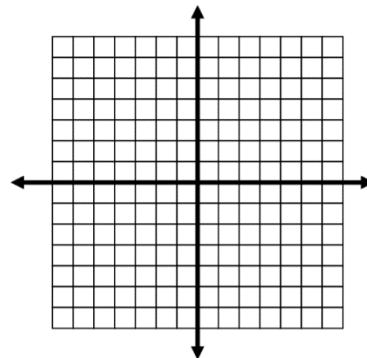
17.  $f(x) = \sqrt{x - 3}$



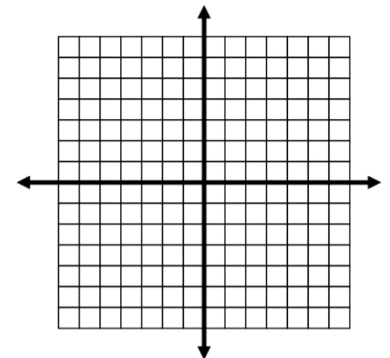
18.  $f(x) = 5$



19.  $f(x) = -3(x + 2)^2 + 1$



20.  $x = -4$



Simplify using the properties of exponents.

21.  $5a^0$

22.  $\frac{3c}{c^{-1}}$

23.  $\frac{2ef^{-1}}{e^{-1}}$

24.  $\frac{(n^3 p^{-1})^2}{(np)^{-2}}$

25.  $3m^2 \cdot 2m$

26.  $(a^3)^2$

27.  $(-b^3 c^4)^5$

28.  $4m(3a^2 m)$

**Simplify the polynomial expressions.**

29.  $3x^3 + 9 + 7x^2 - x^3$

30.  $7m - 6 - (2m + 5)$

31.  $(3a + 1)(a - 2)$

32.  $(s + 3)(s - 3)$

33.  $(5 - c)^2$

34.  $(5x + 7y)(5x - 7y)$

**Factor each expression completely over the set of real numbers. If the polynomial is not factorable, write "Prime".**

35.  $x^2 - 5x + 4$

36.  $a^2 - a - 6$

37.  $z^2 + 4z - 12$

38.  $9n^2 - 4$

39.  $n^2 - 3n + 4$

40.  $60 - 5h - 5h^2$

41.  $2k^2 + 2k - 60$

42.  $-10b^4 - 15b^2$

43.  $9c^2 + 30c + 25$

**Solve each equation.**

44.  $2(5x - 2) = 8x$

45.  $2(y + 5) = 3(y - 8)$

46.  $\frac{x}{8} + 25 = 0$

47.  $2(h + 8) - h = h + 16$

48.  $5x^2 - 120 = 0$

49.  $\frac{(x+3)^2}{4} = 11$

50.  $x^2 - 4x - 12 = 0$

51.  $x^2 + 25 = 10x$

52.  $x^2 - 14x + 19 = 0$

**Evaluate each function for the given value.**

53.  $f(x) = x^2 - 6x + 2$

54.  $g(x) = 6x - 7$

55.  $j(x) = 3 - 2x^2$

$f(3) = \underline{\hspace{2cm}}$

$g(x+h) = \underline{\hspace{2cm}}$

$j(-1) = \underline{\hspace{2cm}}$

**Simplify each rational expression.**

56.  $\frac{5z^3 + z^2 - z}{3z}$

57.  $\frac{m^2 - 25}{m^2 + 5m}$

58.  $\frac{10r^5}{21s^2} \cdot \frac{3s}{5r^3}$

$$59. \frac{a^2 - 5a + 6}{a + 4} \cdot \frac{3a + 12}{a - 2}$$

$$60. \frac{2x}{5} - \frac{x}{3}$$

$$61. \frac{b - a}{a^2 b} + \frac{a + b}{ab^2}$$

**Solve each equation and check your solutions.**

$$62. \frac{12}{x} + \frac{3}{4} = \frac{3}{2}$$

$$63. \frac{x + 10}{x^2 - 2} = \frac{4}{x}$$

$$64. \frac{5}{x - 5} = \frac{x}{x - 5} - 1$$

$$65. \frac{1}{2x} + \frac{1}{x - 1} = \frac{1}{2(x - 1)}$$