

HONORS PRE-CALCULUS ACP

Summer Math Packet

For all incoming Honors Pre-Calculus ACP students, the summer math packet will be on the school website. Students will need to print a copy of the packet and complete problems on the packet/notebook paper.

HOW TO ACCESS SUMMER MATH PACKET HELP

Go to Ms. Hampton's weebly page www.lhamptoniwa.weebly.com and navigate to the Honors Pre-Calculus ACP page. There you will find the summer math packet again as well as videos to help with content. Videos will be labeled according to section headings. You may also e-mail Ms. Hampton lhampton@iwacademy.org

HOME ALGEBRA 1 B ALGEBRA 2 A HONORS ALGEBRA 2 - TRIG HONORS PRE-CALCULUS ACP MORE...

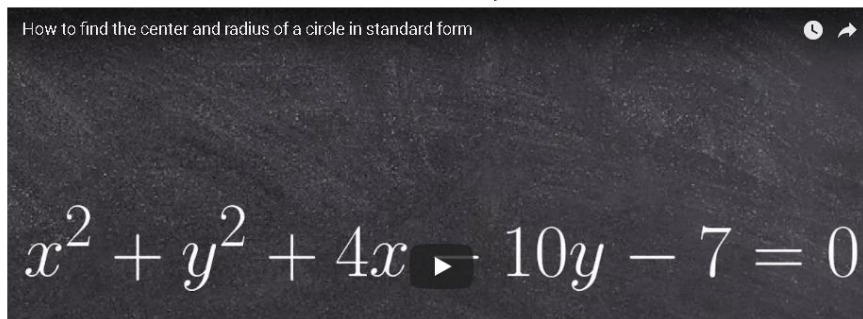


Ms. Hampton
Mathematics Dept.

Once you select the HONORS PRE-CALCULUS ACP page, scroll through to find the video you need to help you complete a section of the packet.

HOME ALGEBRA 1 B ALGEBRA 2 A HONORS ALGEBRA 2 - TRIG HONORS PRE-CALCULUS ACP MORE...

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SUMMER MATH PACKETS

The purpose of the summer math packets is to review topics needed in the course you are taking in the fall. The math department expects you to review and know these topics as we start the new school year.

- **Every summer math packet will be due on MONDAY, AUGUST 20TH and worth 25 POINTS.**
- **A Summer Math Packet Summative Assessment will be due within the first two weeks of school worth 50 POINTS.**

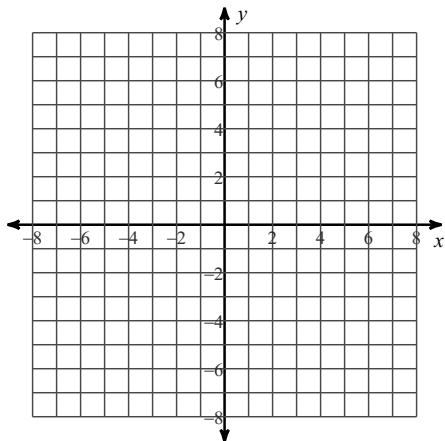
Please email the math department with any questions, iwamath@iwacademy.org or any of the math teachers.

2018 Summer Math Packet - Pre-Calculus

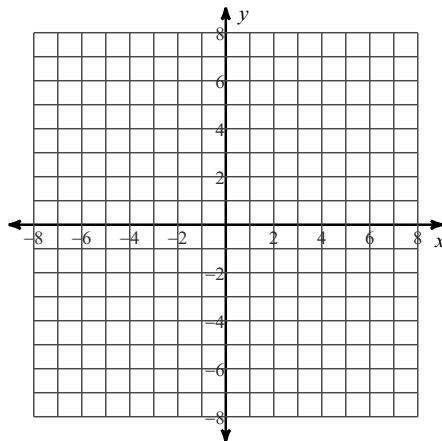
CIRCLES: Graphing

Identify the center and radius of each. Then sketch the graph. (HINT: Problem 3 & 4 - Complete the square to put into General Form)

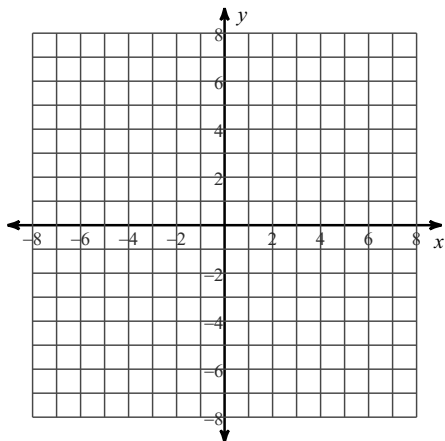
1) $(x + 1)^2 + (y - 3)^2 = 9$



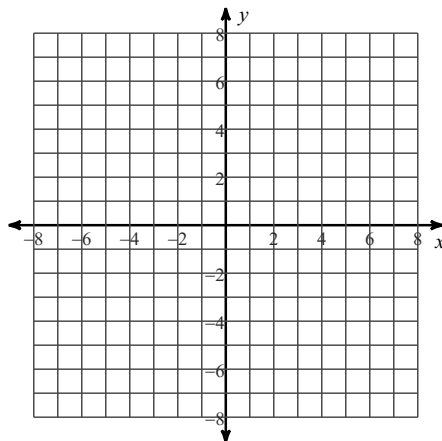
2) $(x - 2)^2 + (y + 2)^2 = 18$



3) $x^2 + y^2 + 8x + 4y + 11 = 0$



4) $x^2 + y^2 - 6x + 8 = 0$



LINES: Writing equations

Write the standard form of the equation of the LINE through the given points.

5) through: $(-4, 4)$ and $(-5, 2)$

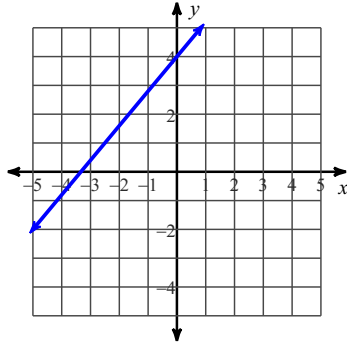
6) through: $(1, -1)$ and $(-5, -3)$

7) through: $(-4, -1)$ and $(0, -1)$

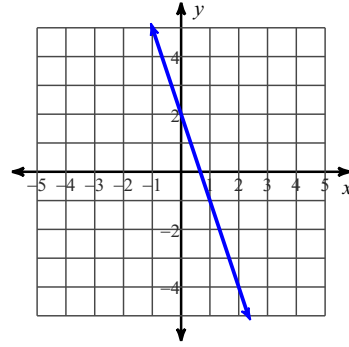
8) through: $(-4, -5)$ and $(-4, 2)$

Write the standard form of the equation of each LINE.

9)



10)



FUNCTIONS: Evaluating

Evaluate each function. Problem 11 - 14 - evaluate with a numerical value. Problem 15 - 18 - evaluate with an expression.

11) $g(x) = 4x - 3$; Find $g(0)$

12) $p(a) = |-3a|$; Find $p(2)$

13) $h(n) = 3^{3n}$; Find $h(-1)$

14) $f(n) = n^2 - 1$; Find $f(-5)$

15) $p(x) = |x - 3| + 2$; Find $p(-2x)$

16) $k(x) = -3x - 2$; Find $k(n - 3)$

17) $h(n) = 2n^3 - 2n$; Find $h(-3n)$

18) $f(n) = n^2 - 5$; Find $f(n + 2)$

FUNCTIONS: Operations (Including Composition)

Perform the indicated operation of functions.

19) $h(n) = 3n + 3$
 $g(n) = -4n - 2$
Find $(h + g)(n)$

20) $g(a) = 2a - 1$
 $f(a) = a^2 + a$
Find $g(a) - f(a)$

21) $f(x) = x^3 + 3x$
 $g(x) = 3x + 1$
Find $f(x) \cdot g(x)$

22) $h(n) = 4n + 2$
 $g(n) = -3n$
Find $\left(\frac{h}{g}\right)(n)$

23) $h(n) = -n + 1$
 $g(n) = n^3 - n$
Find $(h \circ g)(n)$

24) $f(x) = -x$
 $g(x) = x^2 - 2$
Find $f(g(x))$

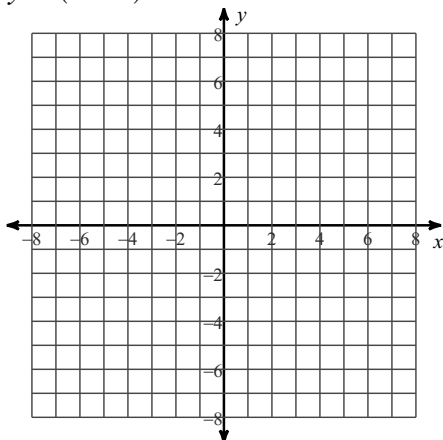
25) $g(n) = 3n - 3$
 $h(n) = -2n^3 - 2$
Find $g(h(n))$

26) $f(n) = n^2 - 3$
 $g(n) = 4n + 1$
Find $f(g(n))$

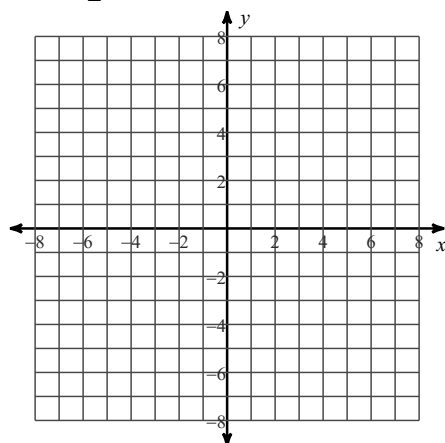
QUADRATICS: Graphing using transformations

Identify the vertex, axis of symmetry, y-intercept, and x-intercepts of each. Then sketch the graph using transformations. State the domain and range in interval notation. (HINT: Problem 29 & 30 - complete the square to put into vertex form.)

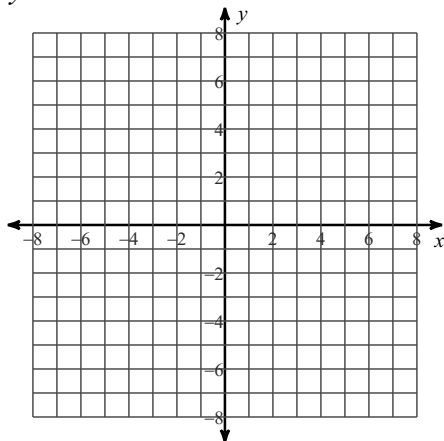
27) $y = (x + 5)^2 - 1$



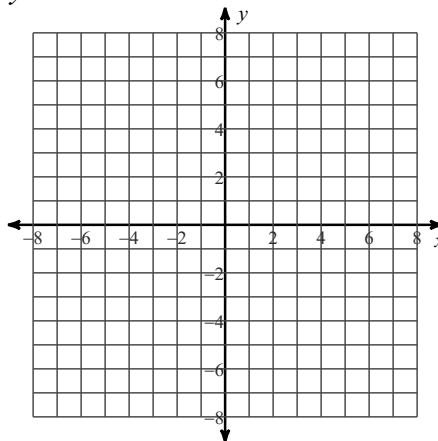
28) $y = -\frac{1}{2}(x - 3)^2 + 2$



$$29) y = -x^2 + 12x - 37$$



$$30) y = 2x^2 - 4x - 6$$



RATIONAL FUNCTIONS: Graphing Characteristics

Identify the holes, vertical asymptotes, x-intercepts, y-intercepts and horizontal asymptote of each. (HINT: Factor first!)

$$31) f(x) = \frac{x^2 - 9}{-3x^2 + 3x + 6}$$

$$32) f(x) = -\frac{4x}{x^3 - 4x}$$

$$33) f(x) = \frac{1}{x^2 - 3x}$$

$$34) f(x) = \frac{2x^2 - 2x - 4}{x^2 + x - 6}$$

RATIONAL EXPRESSIONS: Operations

Simplify each expression.

$$35) \frac{20 - 15r}{6} \cdot \frac{6}{3r^2 - r - 4}$$

$$36) \frac{1}{3x + 3} \div \frac{x - 10}{3x^2 + 33x + 30}$$

$$37) \frac{3}{9r^2 - 15r} - \frac{3}{3r}$$

$$38) \frac{6x}{x - 1} + \frac{6x}{x - 6}$$

POLYNOMIAL FUNCTIONS: Zeros

Find all zeros using FACTORING.

39) $f(x) = x^4 - 10x^2 + 9$

40) $f(x) = x^3 + 3x^2 + 2x$

41) $f(x) = x^3 - 8$

42) $f(x) = x^3 + 5x^2 + 4x + 20$

LOGARITHMS/EXPONENTIAL: Rewriting

Rewrite each equation in logarithmic form.

43) $11^b = a$

44) $4^v = u$

Rewrite each equation in exponential form.

45) $\log_{11} 86 = n$

46) $\log_x 138 = y$

LOG EQUATIONS: Solving

Solve each equation. Remember to check for extraneous solutions.

47) $3 \log_7 (x + 2) = -3$

48) $5 + \log_9 6x = 8$

49) $\ln (8 + 3x^2) = \ln (4x^2 - 7x)$

50) $\log_{20} (5a + 3) = \log_{20} (a^2 - 21)$

51) $\log_9 8 + \log_9 3x = \log_9 51$

52) $\log_7 x - \log_7 (x + 3) = \log_7 12$

53) $\ln (x - 1) - \ln 3 = 4$

54) $\log_6 3x^2 - \log_6 8 = 1$

PROPERTIES OF EXPONENTS:

Simplify. Your answer should contain only positive exponents.

55) $2n \cdot m^3 n^2$

56) $m^4 \cdot 2n^{-4}$

57) $(2x^{-1})^0$

58) $(3x^4 y^{-3})^4$

59) $\frac{2x^2 y^2}{4x^3 y^4}$

60) $\frac{x^{-3}}{3x^0 y^{-1}}$

61) $\frac{x^{-3} y^4}{x^2 y^0 \cdot x^4 y^{-1}}$

62) $(2m^{-3} n^2)^4 \cdot m^{-3} n^2$

EXPONENTIAL EQUATIONS: Solving

Solve each equation WITHOUT using Logs. (HINT: Rewrite each side as an expression using the same base.)

63) $8^x = 32$

64) $\left(\frac{1}{216}\right)^a = 36$

65) $9^{3k+2} = 3^3$

66) $64^{-2k} = \frac{1}{16}$

Solve each equation USING LOGS. Round your answers to the nearest ten-thousandth.

67) $5^{n+3} + 6 = 97$

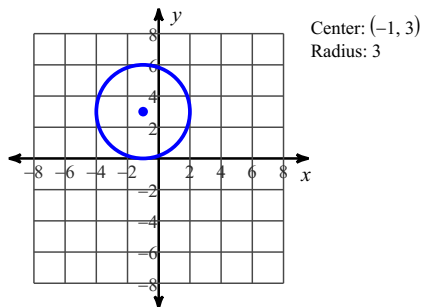
68) $-2 \cdot 5^{-8x} = -86$

69) $e^{k+1.4} + 7.9 = 68.5$

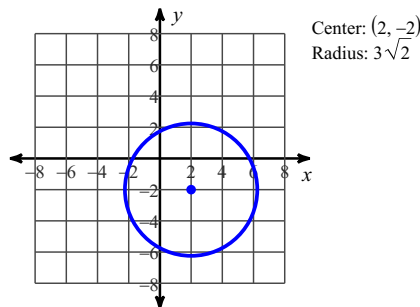
70) $0.4 \cdot 2^{a-4} = 50$

Answers to 2018 Summer Math Packet - Pre-Calculus

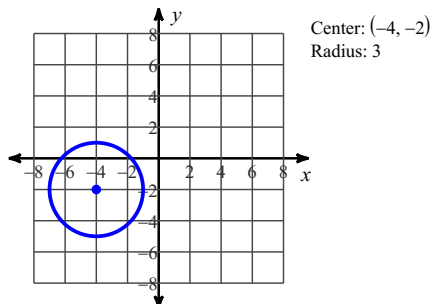
1)



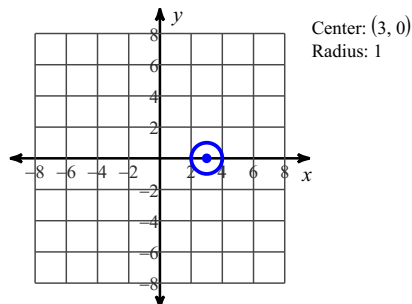
2)



3)



4)



5) $2x - y = -12$

6) $x - 3y = 4$

7) $y = -1$

8) $x = -4$

9) $6x - 5y = -20$

10) $3x + y = 2$

11) -3

12) 6

13) $\frac{1}{27}$

14) 24

15) $|-2x - 3| + 2$

16) $-3n + 7$

17) $-54n^3 + 6n$

18) $n^2 + 4n - 1$

19) $-n + 1$

20) $-a^2 + a - 1$

21) $3x^4 + x^3 + 9x^2 + 3x$

22) $\frac{-4n - 2}{3n}, n \neq 0$

23) $-n^3 + n + 1$

24) $-x^2 + 2$

25) $-6n^3 - 9$

26) $16n^2 + 8n - 2$

27) Vertex: $(-5, -1)$

28) Vertex: $(3, 2)$

Axis of Sym: $x = -5$

Axis of Sym: $x = 3$

y-int: $(0, 24)$

y-int: $(0, -\frac{5}{2})$

x-int: $(-6, 0)$ $(-4, 0)$

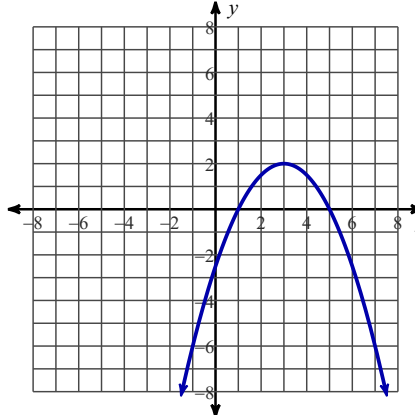
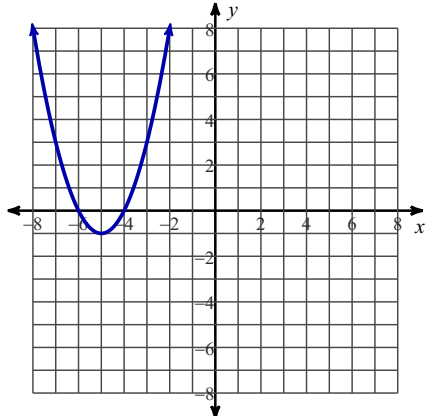
x-int: $(1, 0)$ $(5, 0)$

Domain: $(-\infty, \infty)$

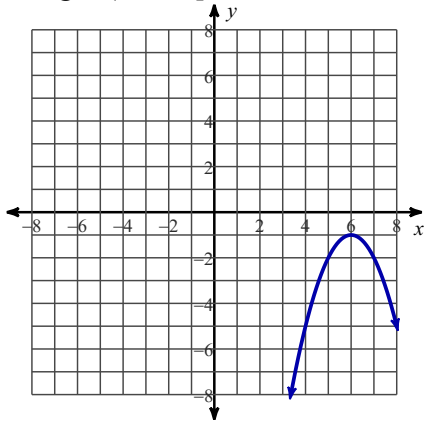
Domain: $(-\infty, \infty)$

Range: $[-1, \infty)$

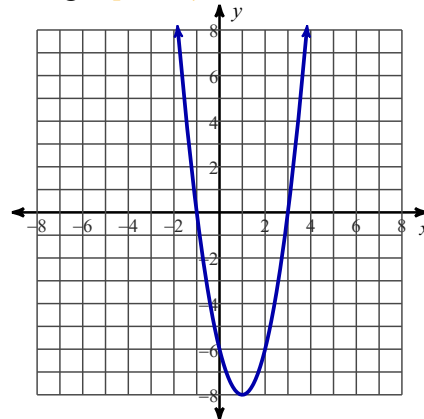
Range: $(-\infty, 2]$



- 29) Vertex: $(6, -1)$
 Axis of Sym: $x = 6$
 y-int: $(0, -37)$
 x-int: No Real
 Domain: $(-\infty, \infty)$
 Range: $(-\infty, 6]$



- 30) Vertex: $(1, -8)$
 Axis of Sym: $x = 1$
 y-int: $(0, -6)$
 x-int: $(-1, 0)$ $(3, 0)$
 Domain: $(-\infty, \infty)$
 Range: $[-8, \infty)$



- 31) Vertical Asym.: $x = 2, x = -1$
 Holes: None
 Horz. Asym.: $y = -\frac{1}{3}$
 X-intercepts: $3, -3$
 Y-intercept: $-\frac{3}{2}$

- 32) Vertical Asym.: $x = 2, x = -2$
 Holes: $x = 0$
 Horz. Asym.: $y = 0$
 X-intercepts: None
 Y-intercept: 0

- 33) Vertical Asym.: $x = 0, x = 3$
 Holes: None
 Horz. Asym.: $y = 0$
 X-intercepts: None
 Y-intercept: None

- 34) Vertical Asym.: $x = -3$
 Holes: $x = 2$
 Horz. Asym.: $y = 2$
 X-intercepts: -1
 Y-intercept: $\frac{2}{3}$

35) $-\frac{5}{r+1}$

36) $\frac{x+10}{x-10}$

37) $\frac{3(2-r)}{r(3r-5)}$

38) $\frac{6x(2x-7)}{(x-6)(x-1)}$

39) $\{3, -3, 1, -1\}$

40) $\{0, -1, -2\}$

41) $\{2, -1 + i\sqrt{3}, -1 - i\sqrt{3}\}$

42) $\{-5, 2i, -2i\}$

43) $\log_{11} a = b$

44) $\log_4 u = v$

45) $11^n = 86$

46) $x^y = 138$

47) $\left\{-\frac{13}{7}\right\}$

48) $\left\{\frac{243}{2}\right\}$

49) $\{-1, 8\}$

50) $\{8\}$

51) $\left\{\frac{17}{8}\right\}$

52) No solution.

53) $\{3e^4 + 1\}$ or 164.7945

54) $\{4, -4\}$

55) $2n^3 m^3$

56) $\frac{2m^4}{n^4}$

57) 1

58) $\frac{81x^{16}}{y^{12}}$

59) $\frac{1}{2xy^2}$

60) $\frac{y}{3x^3}$

61) $\frac{y^5}{x^9}$

62) $\frac{16n^{10}}{m^{15}}$

63) $\left\{\frac{5}{3}\right\}$

64) $\left\{-\frac{2}{3}\right\}$

65) $\left\{-\frac{1}{6}\right\}$

66) $\left\{\frac{1}{3}\right\}$

67) -0.1972

68) -0.2921

69) 2.7043

70) 10.9658