

## PreCalculus Resources

Videos for particular problems from this packet:

<https://www.youtube.com/playlist?list=PLtggZJv4cYwufBNNq1L8f6lxhAYagf6EY>

**In alphabetical order:**

Cool Math	coolmath.com
Just Math Tutorials	patrickjmt.com
Khan Academy	khanacademy.org
Math by Fives	mathbyfives.com
Math TV	mathtv.com
Paul's Online Math Notes	tutorial.math.lamar.edu
Purple Math	purplemath.com
Wolfram Alpha	wolframalpha.com
Youtube	youtube.com

A.1–A.7, A.9, Chapter 1, and Chapter 2

Date: \_\_\_\_\_ Period: \_\_\_\_\_

Show all work. If you think it, write it. If you use a calculator, indicated that. Write your final answer on the blank on the right-hand side. These will be collected on Friday, September 8th at the end of class.

**Find the value of the expression using the given values.**

1)  $| -3x | - | 4y |$   $x = 4, y = 3$  (Section A.1)

1) \_\_\_\_\_

**Insert  $<$ ,  $>$ , or  $=$  to make the statement true.**

2)  $\frac{1}{3}$  \_\_\_\_\_  $0.33$  (Section A.1)

2) \_\_\_\_\_

**Determine which value(s), if any, must be excluded from the domain of the variable in the expression.**

3)  $\frac{x^3 - 9x^2 + 18x}{x^2 - 4x}$  (Section A.1)

3) \_\_\_\_\_

**Solve the problem.**

- 4) Find the area  $A$  and circumference  $C$  of a circle of diameter 23 ft. Use 3.14 for  $\pi$ . Round the result to the nearest tenth. (Section A.2) 4) \_\_\_\_\_

**The lengths of the sides of a triangle are given. Determine if the triangle is a right triangle. If it is, identify the hypotenuse.**

- 5) 12, 16, 20 (Section A.2) 5) \_\_\_\_\_

**Perform the indicated operations. Express the answer as a polynomial written in standard form.**

- 6)  $(2x + 5y)^2$  (section A.3) 6) \_\_\_\_\_

7)  $(9z + 13)(9z - 13)$  (Section A.3)

7) \_\_\_\_\_

**Factor completely. If the polynomial cannot be factored, say it is prime.**

8)  $x^3 + 1000$  (Section A.3)

8) \_\_\_\_\_

9)  $15x^2 + 19x + 6$  (Section A.3)

9) \_\_\_\_\_

Perform the indicated operations and simplify the result. Leave the answer in factored form.

10)  $\frac{9x^4 - 72x}{3x^2 - 12} \cdot \frac{x^2 + x - 2}{4x^3 + 8x^2 + 16x}$  (Section A.3)

10) \_\_\_\_\_

11)  $\frac{4}{x^2 - 3x + 2} + \frac{6}{x^2 - 1}$  (Section A.3)

11) \_\_\_\_\_

**Find the quotient and the remainder using polynomial long division.**

12)  $5x^3 - 7x^2 + 7x - 8$  divided by  $5x - 2$  (Section A.4)

12) \_\_\_\_\_

**Use synthetic division to find the quotient and remainder.**

13)  $5x^4 - 13x^2 - 6x + 9$  divided by  $x - 3$  (Section A.4)

13) \_\_\_\_\_

**Solve the equation.**

14)  $\frac{1}{x} + \frac{1}{x-7} = \frac{x-6}{x-7}$  (Section A.5)

14) \_\_\_\_\_

**Find the real solutions of the equation by factoring.**

15)  $5x^2 + 8x - 4 = 0$  (Section A.5)

15) \_\_\_\_\_

**Solve the equation by the Square Root Method.**

16)  $(2x - 1)^2 = 25$  (Section A.5)

16) \_\_\_\_\_

**Solve the equation.**

17)  $|8x + 3| = 7$  (Section A.5)

17) \_\_\_\_\_

**Write the expression in the standard form  $a + bi$ .**

18)  $(8 + 9i) - (-6 + i)$  (Section A.6)

18) \_\_\_\_\_

19)  $(9 + 5i)(3 - 8i)$

(Section A.6)

19) \_\_\_\_\_

20)  $\frac{2}{6 + 8i}$

(Section A.6)

20) \_\_\_\_\_

**Solve the equation in the complex number system.**

21)  $x^2 + 6x + 25 = 0$

(Section A.6)

21) \_\_\_\_\_



**Solve the problem.**

22) The manager of a candy shop sells chocolate covered peanuts for \$10 per pound and chocolate covered cashews for \$14 per pound. The manager wishes to mix 90 pounds of the cashews to get a cashew-peanut mixture that will sell for \$11 per pound. How many pounds of peanuts should be used? (Section A.7) 22) \_\_\_\_\_

23) A college student earned \$7300 during summer vacation working as a waiter in a popular restaurant. The student invested part of the money at 9% and the rest at 7%. If the student received a total of \$585 in interest at the end of the year, how much was invested at 9%? (Section A.7) 23) \_\_\_\_\_

24) Bob can overhaul a boat's diesel inboard engine in 15 hours. His apprentice takes 30 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency? (Section A.7) 24) \_\_\_\_\_

**Simplify the expression. Assume that all variables are positive when they appear.**

25)  $-4\sqrt{48} - 5\sqrt{75}$  (Section A.9)

25) \_\_\_\_\_

26)  $\sqrt[3]{135}$  (Section A.9)

26) \_\_\_\_\_

**Rationalize the denominator of the expression. Assume that all variables are positive when they appear.**

27)  $\frac{4}{5 - \sqrt{10}}$  (Section A.9)

27) \_\_\_\_\_

**Find the distance  $d(P_1, P_2)$  between the points  $P_1$  and  $P_2$ .**

28)  $P_1 = (2, 4); P_2 = (-1, -7)$  (Section 1.1)

28) \_\_\_\_\_

**Decide whether or not the points are the vertices of a right triangle.**

29)  $(-6, 5), (-4, 9), (-2, 8)$  (Section 1.1)

29) \_\_\_\_\_

**Solve the problem.**

30) If  $(-8, 9)$  is the endpoint of a line segment, and  $(-9, 13)$  is its midpoint, find the other endpoint. (Section 1.1)

30) \_\_\_\_\_

**Find the midpoint of the line segment joining the points  $P_1$  and  $P_2$ .**

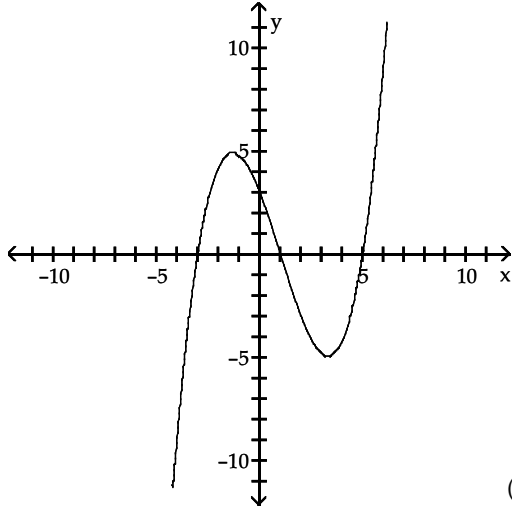
31)  $P_1 = (b, 9); P_2 = (0, 1)$  (Section 1.1)

31) \_\_\_\_\_

List the intercepts of the graph.

32)

32)



(Section 1.2)

List the intercepts for the graph of the equation.

33)  $y = \frac{x^2 - 49}{7x^4}$  (Section 1.2)

33) \_\_\_\_\_

Graph the equation using a graphing utility. Use a graphing utility to approximate the intercepts rounded to two decimal places, if necessary. Use the TABLE feature to help establish the viewing window.

34)  $4x^2 - 5y = 68$  (Section 1.2)

34) \_\_\_\_\_

Solve the problem.

35) If  $(a, 3)$  is a point on the graph of  $y = 2x - 5$ , what is  $a$ ? (Section 1.2)

35) \_\_\_\_\_

Use a graphing utility to approximate the real solutions, if any, of the equation rounded to two decimal places.

36)  $x^4 - 5x^3 + 6x - 2 = 0$  (Section 1.3)

36) \_\_\_\_\_

Solve the equation algebraically. Verify the solution using a graphing utility.

37)  $\sqrt{x+1} = 6$  (Section 1.3)

37) \_\_\_\_\_

38)  $\frac{3x+4}{4} + \frac{5x}{6} = -2$  (Section 1.3)

38) \_\_\_\_\_

39)  $7x + 1 - 7(x + 1) = -2x + 3$  (Section 1.3)

39) \_\_\_\_\_

40)  $x^3 + 6x^2 + 25x + 150 = 0$  (Section 1.3)

40) \_\_\_\_\_

**Solve the problem.**

41) Find an equation of the line through the point  $(-\frac{3}{8}, 8)$  with undefined slope. (Section 1.4) 41) \_\_\_\_\_

**Find an equation for the line with the given properties. Express the answer using the slope–intercept form of the equation of a line.**

42) horizontal; containing the point  $(2.5, -7.7)$  (Section 1.4) 42) \_\_\_\_\_

**Find an equation for the line with the given properties. Express the answer using the general form of the equation of a line.**

43) Parallel to the line  $3x + 2y = 5$ ; containing the point  $(6, 0)$  (Section 1.4) 43) \_\_\_\_\_

**Find an equation for the line with the given properties. Express the answer using the slope–intercept form of the equation of a line.**

44) Perpendicular to the line  $y = -4x - 2$ ; containing the point  $(-3, -4)$  (Section 1.4) 44) \_\_\_\_\_

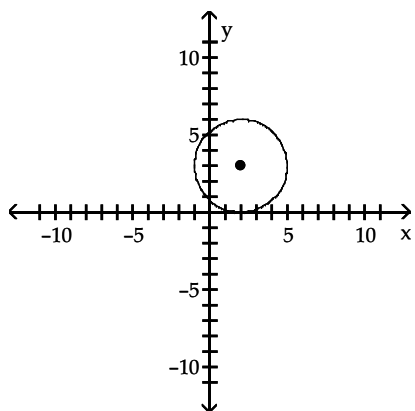
Find an equation for the line with the given properties. Express the answer using the general form of the equation of a line.

45) Perpendicular to the line  $-5x + 3y = 4$ ; containing the point  $(0, 1)$  (Section 1.4) 45) \_\_\_\_\_

46) Containing the points  $(-5, -8)$  and  $(9, 7)$  (Section 1.4) 46) \_\_\_\_\_

Write the standard form of the equation of the circle.

47) 47) \_\_\_\_\_



(Section 1.5)

Find the center  $(h, k)$  and radius  $r$  of the circle.

48)  $x^2 + y^2 + 14x + 12y + 21 = 0$  (Section 1.5) 48) \_\_\_\_\_

**Find the general form of the equation of the circle.**

49) With endpoints of a diameter at (6, -2) and (-4, 4) (Section 1.5)

49) \_\_\_\_\_

**Find the domain of the function.**

50)  $f(x) = \sqrt{3 - x}$  (Section 2.1)

50) \_\_\_\_\_

51)  $g(x) = \frac{x}{x^2 - 1}$  (Section 2.1)

51) \_\_\_\_\_

**Solve the problem.**

52) If  $f(x) = \frac{x - 3A}{-3x + 3}$  and  $f(-3) = -6$ , what is the value of A? (Section 2.1)

52) \_\_\_\_\_



For the given functions  $f$  and  $g$ , find the requested function and state its domain.

53)  $f(x) = 4x - 5$ ;  $g(x) = 2x - 4$  (Section 2.1)

Find  $f - g$ .

53) \_\_\_\_\_

Find the value for the function.

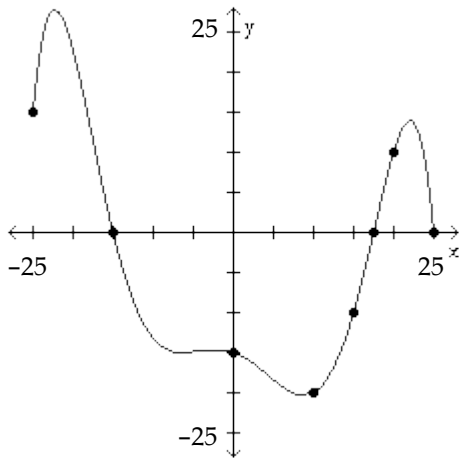
54) Find  $f(-x)$  when  $f(x) = -3x^2 - 4x - 1$ . (Section 2.1)

54) \_\_\_\_\_

The graph of a function  $f$  is given. Use the graph to answer the question.

55) For what numbers  $x$  is  $f(x) > 0$ ? (Section 2.2)

55) \_\_\_\_\_



Use a graphing utility to graph the function over the indicated interval and approximate any local maxima and local minima. If necessary, round answers to two decimal places.

56)  $f(x) = x^4 - 5x^3 + 3x^2 + 9x - 3$ ;  $(-5, 5)$  (Section 2.3)

56) \_\_\_\_\_

Use a graphing utility to find the equation of the line of best fit.

57) 

x	1	3	5	7	9
y	143	116	100	98	90

 (Section 2.4)

57) \_\_\_\_\_

**Solve the problem.**

58) On planet X, an object falls 18 feet in 3 seconds. Knowing the distance it falls varies directly with the square of the time of fall, how long does it take an object to fall 100 feet? Round your answer to three decimal places. (Section 2.4)

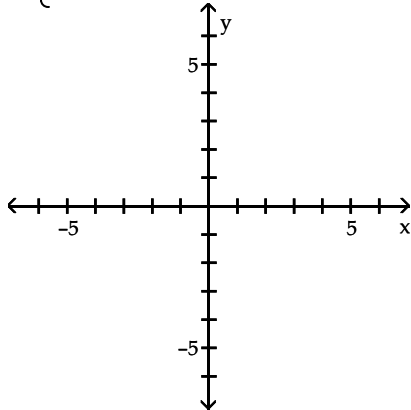
58) \_\_\_\_\_

Graph the function.

59)

59)

$$f(x) = \begin{cases} x - 4 & \text{if } x < 1 \\ -2 & \text{if } x \geq 1 \end{cases} \quad (\text{Section 2.5})$$



A) Find the domain. \_\_\_\_\_ Find the range. \_\_\_\_\_

B) What is  $f(-2)$ ? \_\_\_\_\_  $f(10)$ ? \_\_\_\_\_

Solve the problem.

60) A wire of length  $8x$  is bent into the shape of a square. Express the area  $A$  of the square as a function of  $x$ . (Section 2.7) 60) \_\_\_\_\_

## Answer Key

### Testname: 2020 - PRECALC - SUMMER WORK

- 1) 0
- 2) >
- 3)  $x = 0, x = 4$
- 4)  $A = 415.3 \text{ ft}^2; C = 72.2 \text{ ft}$
- 5) Right triangle; 20
- 6)  $4x^2 + 20xy + 25y^2$
- 7)  $81z^2 - 169$
- 8)  $(x + 10)(x^2 - 10x + 100)$
- 9)  $(3x + 2)(5x + 3)$
- 10)  $\frac{3(x - 1)}{4}$
- 11)  $\frac{10x - 8}{(x - 1)(x + 1)(x - 2)}$
- 12)  $x^2 - x + 1$ ; remainder -6
- 13)  $5x^3 + 15x^2 + 32x + 90$ ; remainder 279
- 14) {1}
- 15)  $\{\frac{2}{5}, -2\}$
- 16) {-2, 3}
- 17)  $\{\frac{1}{2}, -\frac{5}{4}\}$
- 18)  $14 + 8i$
- 19)  $67 - 57i$
- 20)  $\frac{3}{25} - \frac{4}{25}i$
- 21)  $\{-3 - 4i, -3 + 4i\}$
- 22) 270 lb
- 23) \$3700
- 24) 10 hr
- 25)  $-41\sqrt{3}$
- 26)  $3\sqrt[3]{5}$
- 27)  $\frac{20 + 4\sqrt{10}}{15}$
- 28)  $\sqrt{130}$
- 29) Yes
- 30) (-10, 17)
- 31)  $(\frac{b}{2}, 5)$
- 32) (-3, 0), (1, 0), (5, 0), (0, 3)
- 33) (-7, 0), (7, 0)
- 34) (0, -13.60), (4.12, 0), (-4.12, 0)
- 35) 4
- 36) {4.75, 1, 0.38, -1.13}
- 37) {35}
- 38)  $\{-\frac{36}{19}\}$

# Answer Key

## Testname: 2020 - PRECALC - SUMMER WORK

39)  $\{\frac{9}{2}\}$

40)  $\{-6\}$

41)  $x = -\frac{3}{8}$

42)  $y = -7.7$

43)  $3x + 2y = 18$

44)  $y = \frac{1}{4}x - \frac{13}{4}$

45)  $3x + 5y = 5$

46)  $15x - 14y = 37$

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

48)  $(h, k) = (-7, -6); r = 8$

49)  $x^2 + y^2 - 2x - 2y - 32 = 0$

50)  $\{x \mid x \leq 3\}$

51)  $\{x \mid x \neq -1, 1\}$

52)  $A = 23$

53)  $(f - g)(x) = 2x - 1$ ; all real numbers

54)  $-3x^2 + 4x - 1$

55)  $[-25, -15), (17.5, 25)$

56) local minimum at  $(-0.57, -6.12)$

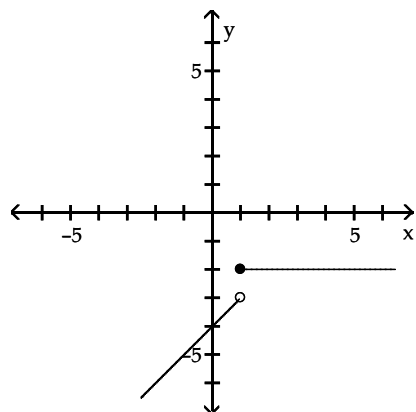
local maximum at  $(1.32, 5.64)$

local minimum at  $(3, -3)$

57)  $y = -6.2x + 140.4$

58) 7.071 sec

59)



60)  $A(x) = 4x^2$