

## Precalculus Summer Assignment

In order to successfully complete this course, you will need to be very familiar with the following Algebra 1 and Algebra 2 topics:

- Solving Multiple step Linear Equations
- Solving lettered Equations
- Properties of radicals
- Simplifying Radical
- Basic Factoring
- Solving quadratic equations by completing a square
- Solving quadratic equations by factoring
- Solving quadratic Equations by using quadratic Formula
- Solving a system of equations and Inequalities
- Modeling

Name \_\_\_\_\_

Date \_\_\_\_\_

**Show work for all questions.** Do not use a calculator unless specified.

1. Simplify:  $20 + 4^3 \div (-8)$

a) 4

b) -4

c) 12

d) -10.5

Answer:

2. Simplify:  $(2a - 4) + 2(a - 5) - 3(a + 1)$

a)  $7a - 11$

b)  $a - 17$

c)  $a - 11$

d)  $7a - 17$

Answer:

3. Evaluate the expression:  $4a^2 - 4ab + b^2$ , when  $a = 2$  and  $b = 5$

a) -14

b) 1

c) 66

d) 81

Answer:

4. Firefighters use the formula  $S = 0.5P + 26$  to compute the horizontal range  $S$  in feet of water from a particular hose, where  $P$  is the nozzle pressure in pounds. Find the horizontal range if pressure is 90 lb.

a) 44 feet

b) 450 feet

c) 19 feet

d) 71 feet

Answer:

5. Simplify:  $2x^2(-3x^2)^3$

a)  $54x^{12}$

b)  $18x^8$

c)  $-18x^{12}$

d)  $-54x^8$

Answer:

6. Simplify:  $\left(\frac{2u^{-5}v^2}{8w}\right)^{-2}$

a)  $\frac{w^2v^4}{4u^7}$

b)  $\frac{16v^4}{w^2u^{10}}$

c)  $\frac{16w^2u^{10}}{v^4}$

d)  $\frac{u^7v^4}{4w^2}$

Answer:

7. Express in scientific notation: 0.0000056

a)  $5.6 \times 10^{-6}$

b)  $5.6 \times 10^6$

c)  $5.6 \times 10^{-5}$

d)  $5.6 \times 10^{-7}$

Answer|:

8. Expand:  $1.20 \times 10^5$

a) 12000000

b) 1200000

c) 120000

d) 12000

Answer:

9. Solve:  $\frac{1}{4}x - \frac{5}{8} = \frac{3}{8}$

a)  $x = 4$

b)  $x = 2$

c)  $x = \frac{1}{2}$

d)  $x = \frac{1}{4}$

Answer:

10. Solve:  $8(x - 2) - 5(x + 4) = 20 + x$

a)  $x = 9$

b)  $x = 28$

c)  $x = -8$

d)  $x = -18$

Answer:

11. Solve for  $m$ :  $F = \frac{mv^2}{r}$

a)  $m = \frac{F}{rv^2}$

b)  $m = Frv^2$

c)  $m = \frac{Fv^2}{r}$

d)  $m = \frac{Fr}{v^2}$

Answer:

12. Solve P:  $A = P + Prt$

a)  $P = A - rt$

b)  $P = \frac{A - rt}{2}$

c)  $P = \frac{A}{1 + rt}$

d)  $P = \frac{A}{2rt}$

Answer:

13. Solve:  $\frac{6}{x-5} = \frac{4}{x}$

a)  $x = -5$

b)  $x = -6$

c)  $x = -10$

d)  $x = 2$

Answer:

14. Solve:  $2|x-3| = 5$

a)  $x = 4, 0$

b)  $x = \frac{1}{2}, \frac{11}{2}$

c)  $x = 0, \frac{11}{2}$

d)  $x = -\frac{1}{2}, -\frac{11}{2}$

Answer:

15. Solve:  $3 - \frac{x}{x-4} = \frac{4}{4-x}$

a)  $x = 4$

b)  $x = -4$

c)  $x = 1$

d) No solution

Answer:

16. Simplify:  $\frac{x^3 + x^2y - 6xy^2}{x^2 - 2xy}$

a)  $x - 2y$

b)  $x(x + 3y)$

c)  $x(x - 2y)$

d)  $x + 3y$

Answer:

17. Simplify:  $\frac{4x^2 - 1}{2x^2 + 5x - 3}$

a) Cannot be simplified

b)  $\frac{2x-1}{x+3}$

c)  $\frac{2x+1}{x-3}$

d)  $\frac{2x+1}{x+3}$

Answer:

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18. Solve:  $-3(2x - 3) \leq 27$

a)  $x \leq -6$

b)  $x \geq -6$

c)  $x \geq -3$

d)  $x \leq -3$

Answer:

19. Solve:  $\frac{2}{3} + \frac{x}{5} < \frac{4}{15}$

a)  $x > 2$

b)  $x > -2$

c)  $x < -2$

d)  $x < 2$

Answer:

20. John averaged 82 out of 100 on his first three tests. What was John's score on the fourth test if his average after the fourth test dropped to 79 out of 100?

a) Cannot be found

b) 80

c) 75

d) 70

Answer:

(Use the calculator for 21)

21. The sales tax rate in Wilson County is 6.75%. Suppose total price of an item that you bought in Wilson County including taxes is \$14.93, what is the price (rounded to two decimal places) before tax?

a) \$12.93

b) \$13.99

c) \$15.94

d) \$8.91

Answer:

22. The long term parking rate at Raleigh-Durham Airport is \$2 per hour (or part of an hour) with \$10 daily maximum (12:00 a.m. to 12:00 a.m.). Suppose you park your car on Friday afternoon at 8:30 p.m. and pick it up on the following Tuesday at 9:30 a.m., what will be your parking fee?

a) \$58

b) \$ 50

c) \$ 48

d) \$ 38

Answer:

23. Solve:  $2x(10x + 8) = -3(x+1)$

a)  $x = \frac{3}{4}, \frac{1}{5}$

b)  $x = -\frac{3}{4}, \frac{1}{5}$

c)  $x = -\frac{3}{4}, -\frac{1}{5}$

d)  $x = \frac{3}{4}, -\frac{1}{5}$

Answer:

24. Solve:  $(2x - 3)^2 - 8 = 0$

a)  $x = \frac{3 \pm 2\sqrt{2}}{2}$

b)  $x = 3, -2$

c)  $x = -3 \pm 2\sqrt{2}$

d)  $x = \frac{-3 \pm 2\sqrt{2}}{2}$

Answer:

(Use the calculator for 25)

25. The profit,  $P$ , realized by a company varies directly as the number of products  $s$  it sells. If a company makes a profit of \$7800 on the sale of 325 products, what is the profit when the company sells 5000 products?

a) \$120,000

b) \$100,000

c) \$80,000

d) \$60,000

Answer:

(Use the calculator for 26)

26. If the voltage,  $V$ , in an electric circuit is held constant, the current  $I$ , is inversely proportional to the resistance,  $R$ . If current is 120mA (milliampere) when resistance is 5 ohms, find the current when the resistance is 15 ohms.

a) 40mA

b) 357mA

c) 360mA

d) 200mA

Answer:

27. A 36 foot long tube is cut into two pieces with ratio 4:5. Find the length of the shorter piece.

a) 9 feet

b) 16 feet

c) 12 feet

d) 20 feet

Answer:

28. A large square pizza has 49 pieces (square slices). John, Jack and Jane ate all the pieces in the ratio 4:2:1 respectively. How many pieces did Jack eat?

a) 10 pieces

b) 12 pieces

c) 14 pieces

d) 18 pieces

Answer:

29. Solve:  $\sqrt{1-2x} + 1 = 3$

a)  $x = 0$

b)  $x = -\frac{3}{2}$

c)  $x = -1$

d)  $x = \frac{1}{2}$

Answer:

30. Solve for  $V$  given  $r = \sqrt{\frac{V}{\pi h}}$

a)  $V = \sqrt{\frac{r}{\pi h}}$

b)  $V = \frac{\pi h}{r^2}$

c)  $V = \pi h r^2$

d)  $V = r\sqrt{\pi h}$

Answer:

31. Find the equation of the straight line passing through the points (2,-4) and (1,0).

a)  $y = -4x + 4$

b)  $y = 4x - 4$

c)  $y = 4x + 4$

d)  $y = -4x - 4$

Answer:

32. Determine the x and y intercepts of the graph of  $7x - 5y = 35$

a) (5, 0) and (0, -7)

b) (-5, 0) and (0, 7)

c) (-5, 0) and (0, -7)

d) (5, 0) and (0, 7)

Answer:

33. The linear relationship between the Fahrenheit scale and Centigrade scale for temperatures is given by  $F = \frac{9}{5}C + 32$ . Which of the following statements, if any, are **TRUE**?

A.  $68^\circ\text{F}$  corresponds to  $20^\circ\text{C}$

B.  $40^\circ\text{C}$  corresponds to  $78^\circ\text{F}$

a) Only A

b) Only B

c) Both A and B

d) Neither A nor B

Answer:

34. John (J) is 5 years older than his sister Mary (M) who is 2 years younger than her brother Paul (P). If J, M and P denote their ages, which one of the following represents the given information?

a)  $\begin{cases} J = M + 5 \\ P = M - 2 \end{cases}$

b)  $\begin{cases} J = M + 5 \\ M = P + 2 \end{cases}$

c)  $\begin{cases} M = J + 5 \\ P = M - 2 \end{cases}$

d)  $\begin{cases} J = M + 5 \\ M = P - 2 \end{cases}$

Answer:

35. Solve the system:  $\begin{cases} 3x - 5y = -4 \\ 3x - y = 4 \end{cases}$

a) (-2, -10)

b) (2, 2)

c)  $\left(2, -\frac{2}{5}\right)$

d)  $\left(\frac{4}{3}, 0\right)$

Answer:

36. The sum of two numbers is 31. Twice the smaller number is 11 more than the larger number. The positive difference between the numbers is

a) 4

b) 3

c) 2

d) 1

Answer:

37. Find the coordinates of a point A whose distance from the origin (0, 0) is 5 units.

a) A (3, 3)

b) A(-3, 2)

c) A(4, -3)

d) A(1, 4)

Answer:

38. Consider the circle given by the equation  $(x - 2)^2 + (y + 1)^2 = 5$ . Find the center and radius.

a) (-2, 1); 5

b) (2, -1); 5

c) (2, -1);  $\sqrt{5}$

d) (-2, 1);  $\sqrt{5}$

Answer:

39. The inequality  $|8 - x| < 8$  is equivalent to

a)  $x < 0$

b)  $x > 0$

c)  $x < 0$  or  $x > 16$

d)  $0 < x < 16$



Answer:

40. The inequality  $|x + 4| \geq 1$  is equivalent to

- a)  $x \geq -5$                       b)  $x \geq -3$  or  $x \leq -5$                       c)  $x \leq -5$                       d)  $-5 \leq x \leq -3$
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Answer:

41. The interval solution to the inequality  $\frac{x-2}{x+1} > 0$  is

- a)  $(2, +\infty)$                       b)  $(-\infty, 2)$                       c)  $(-\infty, -1) \cup (2, +\infty)$                       d)  $(-1, 2)$

Answer:

42. Let  $f(x) = \sqrt{1-2x}$ . Find  $f(a-1)$

- a)  $\sqrt{1-2a} - 1$                       b)  $\sqrt{1-2a}$                       c)  $\sqrt{3-2a}$                       d)  $\sqrt{-2a}$

Answer:

43. Let  $f(x) = 2 - x^2$  and  $g(x) = 2x - 1$ . Which of the following, if any, is **false**?

- a)  $(f + g)(0) = -2$                       b)  $(f - g)(1) = 0$                       c)  $(fg)(2) = -6$                       d)  $\left(\frac{f}{g}\right)(1) = 1$
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Answer:

44. Let  $f(x) = 2 - x^2$  and  $g(x) = 2x - 1$ . Which of the following, if any, is **true**?

- a)  $(f \circ g)(0) = -2$                       b)  $(g \circ f)(0) = 3$   
c)  $(f \circ f)(x) = 4 - 4x^2 + x^4$                       d)  $(g \circ g)(x) = 4x^2 - 4x + 1$

Answer:



28. A large square pizza has 49 pieces (square slices). John, Jack and Jane ate all the pieces in the ratio 4:2:1 respectively. How many pieces did Jack eat?

a) 10 pieces

b) 12 pieces

c) 14 pieces

d) 18 pieces