

# PCTI Geometry



# Summer Packet

2021

**This packet has been designed to help you review various mathematical topics that will be necessary for your success in Geometry.**

**INSTRUCTIONS:**

- Do all problems without a calculator.
- Show all work that leads you to each solution on the attached answer sheet.
- You may use your notes from previous mathematics courses to help you.
- You must do all work without any help from another person.

**ALL work should be completed and ready to turn in on the FIRST DAY of school.**

**GRADING:**

- **Two weighted scores combined will count as one Project grade.**
  - On the first day of school, the teacher will check for completion/effort of the packet.
    - **This will be weighted as 50%.**
  - Teacher will then review the packet with the students.
    - Upon completion of the review, the students will be given an assessment based on the summer packet.
    - **The assessment will be weighted at 50%.**

**Due Date: Wednesday September 8, 2021**

**ENJOY YOUR SUMMER!! WE ARE LOOKING FORWARD TO SEEING YOU IN THE FALL.**

## **ARE YOU STUCK???? Below is a quick "how-to" guide**

### **Number Sense & Operations Finding Percent of**

1. Change the percent to a decimal
2. Multiply the total amount by the decimal

### **Changing Fractions to Decimals**

1. Divide the numerator by the denominator
2. Round to the nearest hundredth if needed

### **Changing Fractions to Percent**

1. Divide the numerator by the denominator
2. Round to the nearest hundredth
3. Drop the decimal point
4. Add a percent sign

### **Solving Multi-Step Operations -- PEMDAS**

1. Complete all computation inside the parenthesis, brackets, or absolute value
2. Carry out all exponents
3. Multiply or divide, from left to right
4. Add or subtract, from left to right

### **Distribution**

1. Multiply the # or variable outside the parenthesis by each term inside the parenthesis
2. Check the signs (+/-)

### **Multiplying Exponents vs. Dividing Exponents**

1. Add & Subtract exponents
2. Multiply & Divide integers

### **Solving with Absolute Value**

1. Set up two equations
2. One with a positive answer
3. One with a negative answer
4. Solve each equation

### **Multiplying by a Fraction**

1. Multiply the numerator by all values
2. Divide this product by the denominator

### **Estimating the value of a Radical ( $\sqrt{\quad}$ )**

1. For a square root, find the closest square number.
2. Estimate the value ( higher/lower)
3. If it's a cube root, find the closest cube number
4. Estimate this value.

### **Multiplying Binomials**

1. Use **FOIL** -- first, outside, inside, last

### **Patterns, Relations, and Algebra Solving Equations for One Variable**

1. Distribute
2. Combine Like Terms
3. Get all the variables on the left side (+/-)
4. Get all number values on the right side (+/-)
5. Divide both sides by the coefficient
6. Remember, whatever you do to one side, you must do to the other

### **Using Proportional Relationships**

1. Determine the Part to Whole relationship
2. Write a ratio for the KNOWN part to whole
3. Determine the second ratio -- given/missing information
4. Set up a proportion with X representing missing value in the UNKNOWN ratio

### **Properties of Proportions**

1. If  $\frac{a}{b} = \frac{c}{d}$ , then  $ad = bc$
2. product of the means = product of the extremes  
Cross multiply to solve for missing variable

### **Ratios used in Proportional Relationships**

1. Part / Whole
2. Percent (%) / 100
3. # of degrees / 360
4. sample / total population
5. Part:Part

### **Solving Systems of Equations w/ Substitution**

- 1) +/- the x term, move to the right side
- 2)  $\div$  by the coefficient of y ( $\div$  by # with y)
- 3) Set the expressions equal to each other & solve for x.
- 4) Substitute x & solve for y.
- 5) Write solution as a coordinate pair (x, y).

### **Using the Equation of a Line/Slope(m)**

$$y = mx + b \quad m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - y_1 = m(x - x_1)$$

Graphing: Begin with b, and move with m

Parallel Slopes:  $m_1 = m_2$

Perpendicular slopes:  $m_1 \cdot m_2 = -1$

*Website Resources for extra help.*

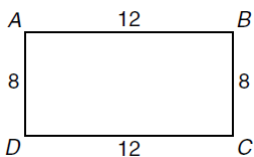
- <http://patrickjmt.com>
- <https://www.khanacademy.org>
- <http://cs.pcti.tec.nj.us/math/lessons/index.htm>
- <http://www.youtube.com/>
- <http://www.regentsprep.org/Regents/math/geometry>
- <http://www.mathsisfun.com>
- <http://www.mathwarehouse.com>
- <http://mathbits.com>
- <http://www.themathpage.com>
- <http://mathplanet.com>

1. What is the greatest common factor of  $6d^2$  and  $18d$ ?
- a.  $6d^2$                       b.  $6d$   
 c.  $3d^2$                       d.  $3d$

2. Find the value of  $\sqrt{49}$ .
- a. 4                              b. 7  
 c. 24                             d. 988

3. Round 17.081 to the nearest tenth.
- a. 17                            b. 17.1  
 c. 17.08                      d. 17.8

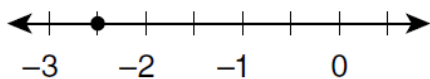
4. What is the ratio of AB to BC, in simplest form?



- a. 1 : 1                        b. 2 : 3  
 c. 3 : 2                        d. 4 : 3

5. Which of the following has a unit rate of 17 miles per hour?
- a. 60 miles in 2 hours  
 b. 85 miles in 5 hours  
 c. 90 miles in 10 hours  
 d. 120 miles in 15 hours

6. Identify the point graphed on the number line.

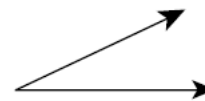


- a. -1.5  
 b. -2.2  
 c. -2.5  
 d. -3.5

7. Which of the following represents a ray?

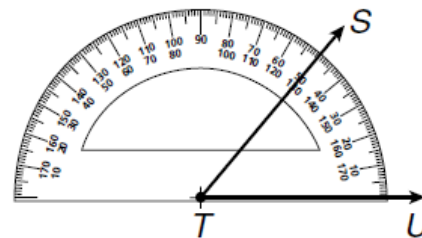
- a.
- b.
- c.
- d.

8. Classify the angle.



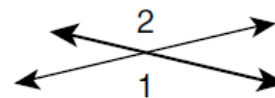
- a. Straight                    b. obtuse  
 c. Right                        d. acute

9. What is the angle measure of STU ?



- a.  $20^\circ$                         b.  $50^\circ$   
 c.  $70^\circ$                         d.  $130^\circ$

10. Select the best description for angles 1 and 2.



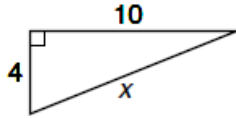
- a. vertical angles  
 b. linear pair  
 c. adjacent angles  
 d. supplementary

11. Two angles of a triangle are  $32^\circ$  and  $110^\circ$ .

What is the measure of the third angle?

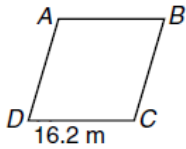
- a.  $218^\circ$
- b.  $142^\circ$
- c.  $180^\circ$
- d.  $38^\circ$

12. Given the right triangle below, what is  $x$ ?



- a. 9.2
- b. 10.8
- c. 84
- d. 116

13. Find the perimeter of rhombus ABCD.



- a. 32.4
- b. 262.44
- c. 64.8
- d. 268.96

14. What is the area of a triangle with a height of 20 meters and a base of 16 meters?

- a.  $160 \text{ m}^2$
- b.  $320 \text{ m}^2$
- b.  $640 \text{ m}^2$
- d.  $656 \text{ m}^2$

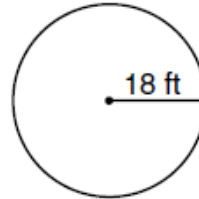
15. Solve  $I = Prt$  for  $r$ .

- a.  $\frac{P}{It}$
- b.  $Irt$
- d.  $\frac{I}{Pt}$

19. What is  $224 \div 14$ ?

c.

16. Find the circumference.



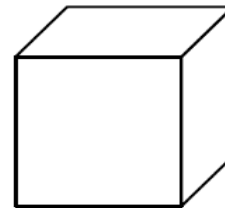
- a.  $81\pi$
- b.  $18\pi$
- c.  $36\pi$
- d.  $9\pi$

17. Write the equation or inequality:

The difference of a number  $c$  and 17 is more than 33

- a.  $c - 17 = 33$
- b.  $17 - c = 33$
- c.  $c - 17 > 33$
- d.  $c - 17 < 33$

18. Determine the volume of a cube with side length 12 ft.



- a.  $36 \text{ ft}^3$
- b.  $144 \text{ ft}^3$
- c.  $864 \text{ ft}^3$
- d.  $1728 \text{ ft}^3$

a. 16

b. 14

c. 12                      d. 8

a. -60                      b. -11

c. 11                        d. 60

**20.** Find the difference.  $18 - 6.8$

a. 12.2                      b. 11.2

c. 2.2                        d. 1.2

**21.** Find the product.  $0.6 \cdot 1.5$

a. 0.9                        b. 9.0

c. 9.9                        d. 90

**22.** Divide  $12.24 \div 2$

a. 2.05                      b. 6.12

c. 8.24                      d. 24.40

**23.** Find the product in simplest form of  $\frac{6}{7} \cdot \frac{2}{3}$ .

a.  $\frac{6}{5}$                         b.  $\frac{8}{21}$

c.  $\frac{4}{7}$                         d.  $\frac{1}{2}$

**24.** Subtract  $\frac{7}{9} - \frac{1}{3}$ .

a.  $\frac{4}{9}$                         b. 1

c.  $\frac{2}{3}$                         d.  $1\frac{1}{9}$

**25.** Subtract  $(-15 - 3)$

a. -18

b. -12

c. 12

d. 18

**26.** Multiply  $15(-4)$

**27.** Simplify  $\sqrt{\frac{64}{100}}$

a.  $\sqrt{\frac{4}{10}}$                       b.  $\frac{2}{5}$

c.  $\sqrt{\frac{4}{5}}$                         d.  $\frac{4}{5}$

**28.** Evaluate  $|12 - 14 - 6|$

a. -32                        b. 8

c. -8                         d. 32

**29.** Simplify the expression  $2(8 - 3) - 6$

a. 7                         b. 4

c. 1                         d. -2

**30.** Which expression is equivalent to the expression  $6(s - 6)$

a.  $6s - 6$                       b.  $s - 6$

c.  $s - 36$                       d.  $6s - 36$

**31.** Simplify  $18 - c + 9c + 6$

a.  $24 + 8c^2$                       b.  $32c$

c.  $24 + 8c$                       d.  $-18c + 15c$

**32.** Which equation corresponds to the statement "the length \_ of the rectangle is four times the width  $w$ ".

a.  $w = 4 + l$                       b.  $w = 4l$

c.  $l = 4w$                         d.  $l = 4 + w$

33. Divide  $\frac{9r^3}{2r^2}$

a.  $\frac{9r^3}{2r}$

b.  $\frac{2r^3}{9r^2}$

c.  $\frac{2}{9r}$

d.  $\frac{9r}{2}$

34. Simplify  $5g(g - 9h)$

a.  $6g^2 - 14gh$

b.  $5g^2 - 45gh$

c.  $5g^2 + 5g - 9h$

d.  $6g^2 - 9h$

35. Simplify  $9x - 4y + 5x - 2y$

a.  $8xy$

b.  $14x^2 - 2y^2$

c.  $14x - 21$

d.  $14x - 6y$

36. What is the product of  $(y + 2)(y - 8)$

a.  $y^2 + 6y - 16$

b.  $y^2 - 6y - 16$

c.  $y^2 - 6y + 16$

d.  $y^2 + 6y + 16$

37. What is the product of  $(2x - 4)(2x - 4)$ ?

a.  $4x^2 - 16$

b.  $4x^2 + 16x - 16$

c.  $4x^2 - 16x + 16$

d.  $4x^2 + 16$

38. Factor  $5x^3 - 15x^2$

a.  $5x^2$

b.  $x^2(5x - 15)$

c.  $5x^2(x - 3)$

d.  $3x^2(x - 5)$

39. Factor the polynomial,  $x^2 + 5x + 6$  completely.

a.  $(x + 6)(x + 1)$

b.  $(x + 3)(x + 2)$

c.  $(x - 3)(x - 2)$

d.  $(x - 6)(x + 1)$

40. Solve the equation  $14c - 6 = 22$

a.  $c = \frac{7}{8}$

b.  $c = 2$

c.  $c = 28$

d.  $c = 308$

41. What value of  $x$  makes this equation  $2x + 18 = 5x$  true?

a.  $x = -6$

b.  $x = 4$

c.  $x = 2.6$

d.  $x = 6$

42. Solve  $A = \frac{1}{2}bh$  for  $h$ .

a.  $h = \frac{A}{2b}$

b.  $h = 2Ab$

c.  $h = \frac{2b}{A}$

d.  $h = \frac{2A}{b}$

43. Evaluate the expression  $18 \div 6 + 4 \cdot 3$

a. 15

b. 20

c. 21

d. 16

44. Which pair of linear equations represent parallel lines?

a.  $\begin{cases} y = 2x + 3 \\ y = -2x + 5 \end{cases}$

b.  $\begin{cases} y = -6x - 5 \\ y = \frac{1}{6}x - 5 \end{cases}$

c.  $\begin{cases} y = -4x - 3 \\ y = -\frac{1}{4}x + 7 \end{cases}$

d.  $\begin{cases} y = 8x + 2 \\ y = 8x - 5 \end{cases}$

45. Solve the proportion  $\frac{5}{8} = \frac{x}{40}$

a.  $x = 5$

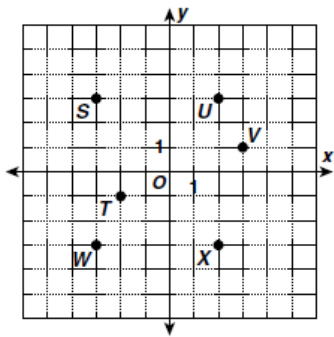
b.  $x = 25$

c.  $x = 10$

d.  $x = 37$



46. Which ordered pair corresponds to point S?



- a.  $(-3, 3)$       b.  $(-2, 1)$   
 c.  $(3, 2)$       d.  $(-3, -2)$

47. Solve for y.  $y^2 - 16 = 9$

- a.  $y = \pm 25$       b.  $y = \pm 5$   
 c.  $y = \pm 4$       d.  $y = \pm 3$

48. What value completes the square for the expression  $x^2 - 6x + \underline{\hspace{1cm}}$ ?

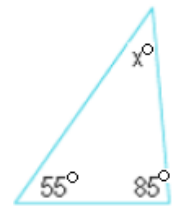
- a. 36                      b. 12  
 c. 9                        d. 3

49. Solve  $x^2 - 4x - 5 = 0$  by factoring.

- a. -1, -5                b. -1, 5  
 c. 1, -5                d. 1, 5

50. Find the value of x.

- a. 10                      b. 40  
 c. 14                      d. 42



51. **Directions: Write the letter of the term next to its definition.**

Definition	Term
___ A triangle with three angles that each measure less than $90^\circ$ .	a. Triangle
___ A triangle with three congruent sides and three congruent angles.	b. Acute triangle
___ A triangle with one angle $90^\circ$	c. Obtuse triangle
___ A triangle with no congruent sides.	d. Right triangle
___ A triangle with at least two congruent sides.	e. Scalene triangle
___ A triangle with one angle greater than $90^\circ$	f. Isosceles triangle
___ A polygon with three sides.	g. Equilateral triangle

**ANSWER SHEET**

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

18. \_\_\_\_\_

19. \_\_\_\_\_

20. \_\_\_\_\_

21. \_\_\_\_\_

22. \_\_\_\_\_

23. \_\_\_\_\_

24. \_\_\_\_\_

25. \_\_\_\_\_

26. \_\_\_\_\_

27. \_\_\_\_\_

28. \_\_\_\_\_

29. \_\_\_\_\_

30. \_\_\_\_\_

31. \_\_\_\_\_

32. \_\_\_\_\_

33. \_\_\_\_\_

34. \_\_\_\_\_

35. \_\_\_\_\_

36. \_\_\_\_\_

37. \_\_\_\_\_

38. \_\_\_\_\_

39. \_\_\_\_\_

40. \_\_\_\_\_



41. \_\_\_\_\_

42. \_\_\_\_\_

43. \_\_\_\_\_

44. \_\_\_\_\_

45. \_\_\_\_\_

46. \_\_\_\_\_

47. \_\_\_\_\_

48. \_\_\_\_\_

49.

50. \_\_\_\_\_

51. \_\_\_ A triangle with three angles that each measure less than  $90^\circ$ .

\_\_\_ A triangle with three congruent sides and three congruent angles.

\_\_\_ A triangle with one angle  $90^\circ$

\_\_\_ A triangle with no congruent sides.

\_\_\_ A triangle with at least two congruent sides.

\_\_\_ A triangle with one angle greater than  $90^\circ$

\_\_\_ A polygon with three sides.

