

This test is divided into 8 sections to help you see if you are ready to start learning the 8 units in the Summit Math Geometry series (summitmath.com). While this book teaches Geometry, it also intentionally incorporates algebra concepts throughout the book to keep them fresh in your memory. If you are familiar with most of the concepts in this test, but just need a little more practice with some of them, you are probably ready to start this book. The majority of the concepts on this Placement Test will be reviewed again before you need to use them to learn new topics.

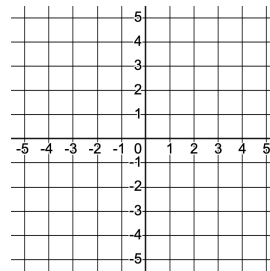
Only use a calculator when you see this icon: 

Use additional paper as needed. When you finish, check your answers using the provided Answer Key.

Unit 1: Points, Lines & Angles

1. Plot the points $(-2, 3)$ and $(4, -1)$. Connect them with a line segment.

What is the slope of the segment?



2. A line passes through the points $(-2, 3)$ and $(4, -1)$. Write the line's equation in Point-Slope Form.

3. Solve the equation.

$$\frac{7 - 4}{-3 + 1} = \frac{A - 2}{6 + 2}$$

4. Factor each trinomial.

a. $x^2 + 4x - 21$

b. $x^2 - 25x + 84$

5. Solve the equation.

a. $4x - 7 = 2x + 13$

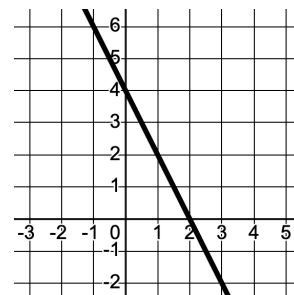
b. $3(x + 40) + 2x = 180$

6. Solve each equation.

a. $x^2 + x - 20 = 0$

b. $x^2 = 8x - 15$

7. Write the equation of the line in Slope-Intercept Form.



8. What is the average of each pair of numbers?

a. 2 and 12

b. 9 and 14

c. -4 and 11

9. What is the Pythagorean Theorem?

10. Solve the equation.

$$5^2 + x^2 = 10^2$$

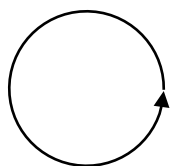
11. Simplify each expression.

a. $\sqrt{(7 - 3)^2 + (11 - 8)^2}$

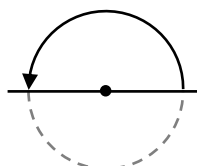
b. $\sqrt{9 + 81}$

12. How many degrees of rotation are represented in each diagram?

a.



b.



c.



13. Solve the system of equations.

$$3x - y = 50$$

$$x + 2y = 110$$

14. When two lines have the same slope and do not intersect, they are called _____.

15. Lines A and B intersect at 90° angles. They are called _____ lines.

The slope of line A is 3. What is the slope of line B?

Unit 2: Triangles, Similarity & Polygons

16. Simplify as much as you can.

a. $(5\sqrt{3})^2$

b. $\sqrt{(3 + 3\sqrt{5}) + (21 - 3\sqrt{5})}$

c. $(-\sqrt{2} - 3)^2$

17. Simplify each fraction.

a. $\frac{42}{48}$

b. $\frac{2.4}{3.2}$

18. Solve each equation.

a. $\frac{x}{8} = \frac{3}{4}$

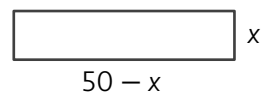
b. $\frac{x+2}{5} = \frac{12}{10}$

Unit 3: Quadrilaterals

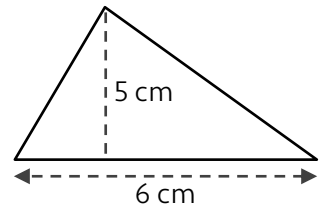
19. What is the area and perimeter of the rectangle shown?

a. area:

b. perimeter:



20. A triangle's area is $\frac{1}{2}(\text{base})(\text{height})$. What is the area of the triangle shown?



21. Solve the equation.

$$\frac{7x + 2 + 3x - 8}{2} = 2x + 9$$

Unit 4: Special Right Triangles

22. Simplify each expression.

a. $2\sqrt{6}\sqrt{3}$

b. $4\sqrt{5} + 4\sqrt{5}$

23. Simplify each expression.

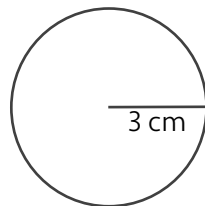
a. $\frac{\sqrt{8}}{\sqrt{2}}$

b. $\frac{2}{\sqrt{2}} + \sqrt{2}$

24. Calculate the area and circumference of the circle shown.

a. Area: _____

b. Circumference: _____



25. Solve the equation.

$$x^2 + (x + 1)^2 = (x + 2)^2$$

Unit 5: Areas of 2D Shapes

26. What is the area of a rectangle with a length of 13 inches and a width of 7 inches?

27. Simplify the formula if $b = 10$ and $h = 9$.

$$A = \frac{1}{2}bh$$

28. Simplify each expression.

a. $(3x^2 + 2x) - (2x^2 - 5x)$

b. $(3x + 2)(2x - 5)$

c. $(6x^6) \div (2x^2)$

29. Write the expression $3x^2 + 6x$ in factored form.

30. Solve each equation.

a. $\frac{1}{27} = \frac{1}{3} \cdot \frac{1}{3} \cdot x$

b. $80\sqrt{5} = \frac{16\sqrt{5} \cdot h}{2}$

31. Simplify the expression.

$$\sqrt{12}(3 + 2\sqrt{3})$$

32. Solve the equation.

$$\frac{x}{4} = \frac{4}{6+x}$$

Unit 6: Circles

33. Evaluate the expression πr^2 if $r = 6$. Write the exact, unrounded result in terms of π .

34.  Solve each equation. Round to the tenth.

a. $45.24 = 2\pi r$

b. $74 = \pi r^2$

35. Simplify this expression: $\frac{70}{360} \cdot 6\pi$

36.  Evaluate each expression. Round to the tenth.

a. $\frac{2}{3} \cdot 2\pi(1.9)$

b. $\pi(6.5)^2$

Unit 7: Right Triangle Trigonometry

37. Simplify each fraction.

a. $\frac{x}{2x}$

b. $\frac{x\sqrt{3}}{2x}$

c. $\frac{x}{x\sqrt{2}}$

38. Solve each equation.

a. $0.5 = \frac{x}{12}$

a. $28 = \frac{7}{x}$

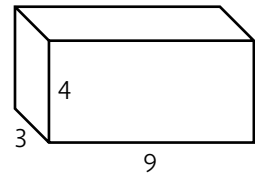
39.  Evaluate each expression. Put the calculator in Degree Mode. Round to the hundredth.

a. $8\sin 35^\circ$

b. $\frac{40}{\cos 20^\circ}$

Unit 8: Surface Area & Volume

40. How many rectangles form the outside surface of the box shown?
Draw them and label the length and width of each rectangle.

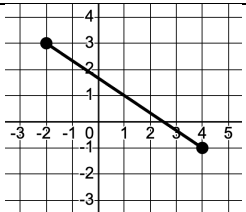
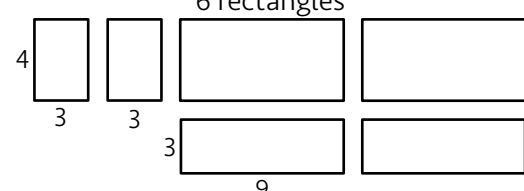


41. Evaluate each expression if $r = 3$ and $h = 1.5$. Write each result in terms of π .

a. $2\pi r^2 + 2\pi rh$

b. $\frac{4}{3}\pi r^3$

Answer Key

1.	 $\frac{-1-3}{4-(-2)} = \frac{-4}{6} \rightarrow -\frac{2}{3}$
2.	Point-Slope Form: $y - y_1 = m(x - x_1)$ slope: $-\frac{2}{3}$ point: $(-2, 3)$ or $(4, -1)$ Equation: $y - 3 = -\frac{2}{3}(x + 2)$ or $y + 1 = -\frac{2}{3}(x - 4)$
3.	$\frac{3}{-2} = \frac{A-2}{8} \rightarrow 24 = -2A + 4 \rightarrow A = -10$
4.	a. $(x-3)(x+7)$ b. $(x-4)(x-21)$
5.	a. $2x - 7 = 13 \rightarrow 2x = 20 \rightarrow x = 10$ b. $3x + 120 + 2x = 180 \rightarrow 5x = 60 \rightarrow x = 12$
6.	a. $(x-4)(x+5) = 0 \rightarrow x = 4$ or -5 b. $x^2 - 8x + 15 = 0 \rightarrow (x-5)(x-3) = 0$ $\rightarrow x = 5$ or 3
7.	$y = -2x + 4$
8.	a. 7 b. $\frac{9+14}{2} \rightarrow 11.5$ c. $\frac{-4+11}{2} \rightarrow 3.5$
9.	$a^2 + b^2 = c^2$
10.	$25 + x^2 = 100 \rightarrow x^2 = 75 \rightarrow x = 5\sqrt{3}$
11.	a. $\sqrt{(4)^2 + (3)^2} \rightarrow \sqrt{16+9} \rightarrow \sqrt{25} \rightarrow 5$ b. $\sqrt{90} \rightarrow 3\sqrt{10}$
12.	a. 360° b. 180° c. 90°
13.	Using the substitution method: $3x - 50 = y$ $\rightarrow x + 2(3x - 50) = 110 \rightarrow x = 30$ $y = 3x - 50 \rightarrow y = 3(30) - 50 \rightarrow y = 40$ solution: $(30, 40)$
14.	parallel
15.	perpendicular lines; slope of line B is $-\frac{1}{3}$
16.	a. $25\sqrt{9} \rightarrow 75$ b. $\sqrt{24} \rightarrow 2\sqrt{6}$ c. $(-\sqrt{2}-3)(-\sqrt{2}-3)$ $\rightarrow 2 + 3\sqrt{2} + 3\sqrt{2} + 9 \rightarrow 11 + 6\sqrt{2}$
17.	a. $\frac{42}{48} \div \frac{6}{8} = \frac{7}{8}$ b. $\frac{2.4}{3.2} \cdot \frac{10}{10} = \frac{24}{32} \div \frac{8}{8} = \frac{3}{4}$
18.	a. $4x = 24 \rightarrow x = 6$ b. $10x + 20 = 60 \rightarrow x = 4$
19.	a. $x(50-x) \rightarrow 50x - x^2$ b. $2(50-x) + 2x \rightarrow 100 - 2x + 2x \rightarrow 100$
20.	$\frac{1}{2}(6)(5) \rightarrow 15 \text{ cm}^2$
21.	$\frac{10x-6}{2} = 2x+9 \rightarrow 5x-3 = 2x+9$ $\rightarrow 3x = 12 \rightarrow x = 4$
22.	a. $2\sqrt{18} \rightarrow 2 \cdot 3\sqrt{2} \rightarrow 6\sqrt{2}$ b. $8\sqrt{5}$
23.	a. $\sqrt{\frac{8}{2}} \rightarrow \sqrt{4} \rightarrow 2$ b. $\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} + \sqrt{2} \rightarrow \frac{2\sqrt{2}}{2} + \sqrt{2}$ $\rightarrow \sqrt{2} + \sqrt{2} \rightarrow 2\sqrt{2}$
24.	Area: $\pi r^2 \rightarrow \pi(3)^2 \rightarrow 9\pi \text{ cm}^2$ Circumference: $2\pi r \rightarrow 2\pi(3) \rightarrow 6\pi \text{ cm}$
25.	$x^2 + (x^2 + 2x + 1) = (x^2 + 4x + 4)$ $2x^2 + 2x + 1 = x^2 + 4x + 4$ $\rightarrow x^2 - 2x - 3 = 0 \rightarrow (x-3)(x+1) = 0$ $x = 3$ or -1
26.	(length)(width) $\rightarrow (13)(7) \rightarrow 91 \text{ inches}^2$
27.	$A = \frac{1}{2}(10)(9) \rightarrow A = 45$
28.	a. $3x^2 + 2x - 2x^2 + 5x \rightarrow x^2 + 7x$ b. $6x^2 - 15x + 4x - 10 \rightarrow 6x^2 - 11x - 10$ c. $\frac{6}{2}x^{6-2} \rightarrow 3x^4$
29.	$3x(x+2)$
30.	a. $\frac{1}{27} = \frac{1}{9}x \rightarrow 9 \cdot \frac{1}{27} = \frac{1}{9}x \cdot 9 \rightarrow \frac{1}{3} = x$ b. $80\sqrt{5} = 8\sqrt{5}h \rightarrow h = 10$
31.	$3\sqrt{12} + 2\sqrt{36} \rightarrow 3 \cdot 2\sqrt{3} + 2 \cdot 6 \rightarrow 6\sqrt{3} + 12$
32.	$6x + x^2 = 16 \rightarrow x^2 + 6x - 16 = 0$ $\rightarrow (x-2)(x+8) = 0 \rightarrow x = 2$ or -8
33.	$\pi(6)^2 \rightarrow 36\pi$
34.	a. $\frac{45.24}{2\pi} = r \rightarrow r \approx 7.2$ b. $\frac{74}{\pi} = r^2 \rightarrow r = \pm \sqrt{\frac{74}{\pi}} \rightarrow r \approx \pm 4.9$
35.	$\frac{7}{36} \cdot \frac{6\pi}{1} \rightarrow \frac{42\pi}{36} \rightarrow \frac{7\pi}{6}$
36.	a. $7.9587 \rightarrow \approx 8.0$ b. $13.732 \rightarrow \approx 13.7$
37.	a. $\frac{1}{2}$ b. $\frac{\sqrt{3}}{2}$ c. $\frac{1}{\sqrt{2}} \rightarrow \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \rightarrow \frac{\sqrt{2}}{2}$
38.	a. $x = 0.5 \cdot 12 \rightarrow x = 6$ b. $x \cdot 28 = \frac{7}{x} \cdot x \rightarrow 28x = 7 \rightarrow x = \frac{1}{4}$
39.	a. $4.5886 \rightarrow \approx 4.59$ b. $4.2567 \rightarrow \approx 4.26$
40.	6 rectangles 
41.	a. $2\pi(3)^2 + 2\pi(3)(1.5) \rightarrow 18\pi + 9\pi \rightarrow 27\pi$ b. $\frac{4}{3}\pi(3)^3 \rightarrow \frac{4}{3}\pi(27) \rightarrow 36\pi$