

Sample Documents

W Carolina U Math Contest
(WCC)

E D U C A I D E S O F T W A R E

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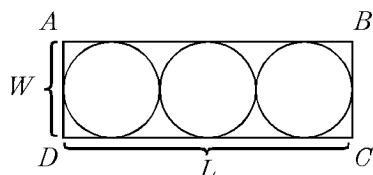
Math 4H
Week 7 Test

Name _____

Teacher _____

Circle answers. Show all work on scratch paper.

1. The given rectangle $ABCD$ is circumscribed about three tangential circles. Find the length DC in terms of the width AD .



- a) $L = 2W$ b) $L = 3W$ c) $2L = W$
d) $3L = W$ e) $L = 6W$

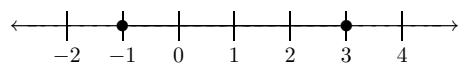
3. The solution set written as intervals that satisfies both $|x - 3| \leq 6$ and $|x + 2| < 5$ is:

- a) $(-7, -3)$ b) $(-3, 9]$ c) $(3, 9]$
d) $(-7, 9]$ e) $[-3, 3)$

5. If $f(x) = x^2 + x$ and $g(x) = x - 1$, then $g(f(3))$ is:

- a) 6 b) 11 c) 12 d) 24 e) 14

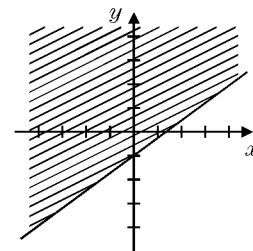
7. The graph shown is correctly represented by:



- a) $-1 < x \leq 3$
b) $-1 \leq x \leq 3$
c) $\{x > -1\} \cup \{x < 3\}$
d) $\{-1, 0, 1, 2\}$
e) $\{x \geq -1\} \cap \{x < 3\}$

2. Which sentence represents the graph shown here? (Assume the x -axis and y -axis are both marked-off in intervals of one unit.)

- a) $y \geq \frac{3}{4}x + 1$
b) $y \leq -\frac{3}{4}x - 1$
c) $y \leq -\frac{3}{4}x + 1$
d) $y \geq \frac{3}{4}x - 1$
e) $y \leq \frac{3}{4}x - 1$



4. If $c^2 - dx - cx + d^2 = 0$ and $c \neq -d$, then x equals:

- a) $c + d$ b) $c^2 + d^2$ c) cd
d) $d - c$ e) $\frac{c^2 + d^2}{c + d}$

6. The function $f(x) = ax^2 - bx - 4$ has $f(2) = 6$ and $f(-1) = 12$. Then a is:

- a) 2 b) 7 c) -2 d) 1 e) -3

8. The domain of the function $f(x) = \sqrt{\frac{x}{x^2 + 4}}$ is:

- a) $(-\infty, \infty)$
b) $[0, \infty)$
c) $(0, \infty)$
d) $(-\infty, 0) \cup (0, \infty)$
e) $(-\infty, -2) \cup (-2, 0) \cup (0, 2) \cup (2, \infty)$

9. Which of the following is the equation of a line parallel to the line whose equation is $y = \frac{3}{5}x + 1$?
- a) $6x + 10y = 13$ b) $5x - 3y = 6$
 c) $3x - 5y = 6$ d) $y = \frac{5}{3}x - 6$
 e) $\frac{5}{6}x - \frac{1}{2}y = 1$
10. A collection of stamps consists of 5¢ , 13¢ , and 18¢ stamps. The number of 13¢ stamps is two more than three times the number of 5¢ stamps. The number of 18¢ stamps is five less than the number of 13¢ stamps. The total value of all the stamps is $\$1.68$. Find the number of 18¢ stamps.
- a) 3 b) 4 c) 5 d) 2
 e) none of the above
11. In a trapezoid the bases are 5 inches and 8 inches, and the legs are 4 inches and 6 inches. If the legs are extended to meet in a point, how much must the shorter leg be extended?
- a) 10 inches b) $5\frac{1}{3}$ inches c) $8\frac{1}{2}$ inches
 d) 4 inches e) $6\frac{2}{3}$ inches
12. $\frac{3 - 2i}{3 + i} + \frac{4i}{3 - 7i}$ equals:
- a) $\frac{1}{2} - \frac{1}{3}i$ b) $\frac{63}{290} - \frac{201}{290}i$ c) $\frac{11}{130} + \frac{3}{130}i$
 d) $-\frac{8}{13} + \frac{12}{13}i$ e) $-\frac{8}{13} - \frac{12}{130}i$
13. Which of the following is not a valid congruence theorem for triangles?
- a) SAS b) SSA c) SSS
 d) ASA e) SAA
14. The least common multiple of 15 and 90 is:
- a) 450 b) 270 c) 1350 d) 90
 e) none of the above
15. $\sqrt{-105}$ is equal to:
- a) $i\sqrt{-105}$ b) $5i\sqrt{21}$ c) $i\sqrt{105}$
 d) $3i\sqrt{35}$ e) $105i$
16. If $m = \{2, 4, 6\}$ and $n = \{x, y\}$, which of the following is a subset of Cartesian Product $m \times n$?
- a) $(2, x)$ b) $\{2, y\}$ c) $\{(y, 6)\}$
 d) $\{(4, x)\}$ e) $(y, 2)$
17. Which of the following measures of central tendency is most affected by extreme values?
- a) Mean b) Median c) Mode
 d) Range e) Midrange
18. Let D be the determinant of a 2×2 matrix with integer entries. What is the probability that D is even?
- a) $\frac{7}{16}$ b) $\frac{3}{8}$ c) $\frac{1}{2}$ d) $\frac{5}{8}$ e) $\frac{11}{16}$

Answer List

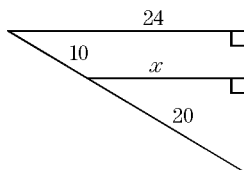
- | | | |
|-------|-------|-------|
| 1. b | 2. d | 3. e |
| 4. e | 5. b | 6. b |
| 7. b | 8. b | 9. c |
| 10. a | 11. e | 12. b |
| 13. b | 14. d | 15. c |
| 16. d | 17. a | 18. d |
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Catalog List

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|---------------|---------------|---------------|
| 1. WCC BB 27 | 2. WCC BD 103 | 3. WCC AA 52 |
| 4. WCC AC 11 | 5. WCC AE 14 | 6. WCC AH 72 |
| 7. WCC AI 5 | 8. WCC AK 90 | 9. WCC AM 52 |
| 10. WCC AN 77 | 11. WCC BE 66 | 12. WCC AP 19 |
| 13. WCC CC 12 | 14. WCC DB 6 | 15. WCC DC 6 |
| 16. WCC DE 19 | 17. WCC EA 12 | 18. WCC FB 18 |

1. What is the value of length x ?

- (a) 12
(b) 14
(c) 16
(d) 18
(e) 20



2. What is the length of an arc intercepted by one side of a regular hexagon inscribed in a circle of radius 18?

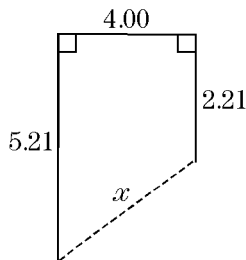
- (a) 60
(b) 2π
(c) 3π
(d) 6π
(e) 60π

3. The lengths of two sides of a triangle are 10 and 14. Which of the following *could* be the length of the third side?

- (a) 2
(b) 4
(c) 22
(d) 24
(e) 26

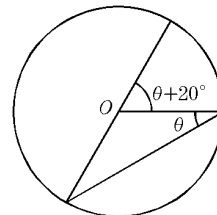
4. What is the value of length x ?

- (a) 1.79
(b) 3.00
(c) 3.21
(d) 5.00
(e) 5.21



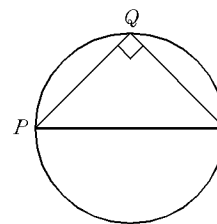
5. Suppose that O is the center of the circle shown. What is the degree measurement of θ ?

- (a) 5°
(b) 10°
(c) 15°
(d) 20°
(e) 30°



6. An isosceles right triangle is inscribed in a circle of radius 4. What is the length of the arc \widehat{PQ} ?

- (a) $\frac{\pi}{2}$
(b) $\frac{3\pi}{4}$
(c) 4π
(d) 2π
(e) π

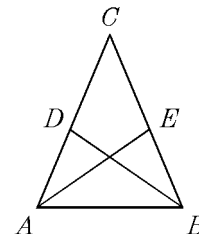


7. A trapezoid has area 39 square inches, height 6 inches, and one base of length of 6 inches. What is the length of the other base?

- (a) $\frac{39}{18}$
(b) $\frac{33}{12}$
(c) 7
(d) 9
(e) 18

8. Suppose that the length of \overline{CA} equals the length of \overline{CB} , the length of \overline{CD} equals the length of \overline{CE} , the measurement of $\angle CDB$ is 100° , and the measurement of $\angle DCE$ is 45° . What is the degree measure of $\angle AEC$?

- (a) 80°
(b) 100°
(c) 115°
(d) 135°
(e) 145°

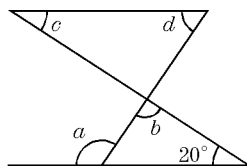


9. In parallelogram $ABCD$, the measure of $\angle ABC$ exceeds the measure degree of $\angle DAB$ by 10° . What is the measure of $\angle ABC$?

- (a) 75°
 (b) 85°
 (c) 95°
 (d) 105°
 (e) 115°

10. Which of the following gives the measure of angle a in terms of angles b , c , and d ?

- (a) $200^\circ - c - d$
 (b) $160^\circ - c - d$
 (c) $160^\circ - 2b + c + d$
 (d) $c + d - 20^\circ$
 (e) $200^\circ - b + c + d$



11. A circle passes through the vertices of a right triangle with sides 6, 8, and 10. What is the radius of the circle?

- (a) 4
 (b) 4.6
 (c) 5
 (d) 6
 (e) 6.4

12. What is the length of the longest thin rigid straight rod that can fit entirely within a rectangular box having side lengths 1, 2, and 3?

- (a) $\sqrt{5}$
 (b) $\sqrt{6}$
 (c) $\sqrt{8}$
 (d) $\sqrt{10}$
 (e) $\sqrt{14}$

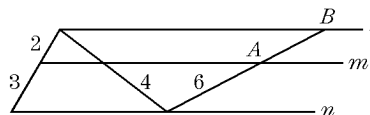
13. What is the sum of the degree measures of the interior angles of a polygon with 10 sides?

- (a) 1440°
 (b) 1620°
 (c) 1800°
 (d) 1980°
 (e) 2160°

14. All of the exterior angles of a polygon measure 20° . How many sides does the polygon have?

- (a) 8
 (b) 9
 (c) 12
 (d) 18
 (e) 27

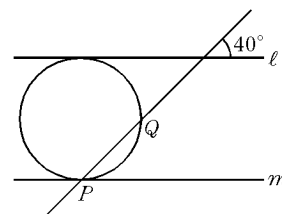
15. Lines ℓ , m , and n are parallel. What is the length of AB ?



- (a) 1
 (b) $\frac{8}{3}$
 (c) 3
 (d) 4
 (e) 5

16. A circle of radius 9 is tangent to the two parallel lines ℓ and m . What is the length of the arc \widehat{PQ} ?

- (a) 2π
 (b) 4π
 (c) 8π
 (d) 5π
 (e) 3π



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WESTERN CAROLINA UNIVERSITY 1998 GEOMETRY TEST 3/11/97

Answer List

- | | | |
|-------|-------|-------|
| 1. c | 2. d | 3. c |
| 4. d | 5. d | 6. d |
| 7. c | 8. b | 9. c |
| 10. a | 11. c | 12. e |
| 13. a | 14. d | 15. d |
| 16. b | | |
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Catalog List

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|----------------|----------------|----------------|
| 1. WCC BE 136 | 2. WCC BC 85 | 3. WCC BE 137 |
| 4. WCC BE 138 | 5. WCC BC 87 | 6. WCC BC 88 |
| 7. WCC BE 139 | 8. WCC BA 117 | 9. WCC BA 118 |
| 10. WCC BA 119 | 11. WCC BC 89 | 12. WCC BF 137 |
| 13. WCC BA 120 | 14. WCC BF 138 | 15. WCC BE 140 |
| 16. WCC BC 90 | | |