



College entrance exam and science high school entrance test tips. Conquer UPCAT, ACET, USTET, DLSUCET, PSHS-NCE, and other entrance tests.

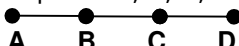
MATHEMATICS PROFICIENCY (Geometry/ Trigonometry)

Directions: This subtest is a measure of ability to think out solutions to quantitative problems. Solve each problem carefully and then decide which is the best among the answer choices. Blacken the circle it corresponds to after the appropriate item number on your answer sheet.

Notes:

- ▶ Calculators of any kind are not permitted. All numbers used are real numbers.
- ▶ Figures which accompany problems in this subtest are intended to provide information useful in solving the problems. They are drawn as accurately as possible except when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

BEGIN HERE:

1. How many different segments are determined by four collinear points A, B, C, D?
a. 4
b. 8
c. 6
d. 10
- 
2. Which of the following statements is/are true?
 - I. Two points are contained in one and only one line.
 - II. A segment has a unique midpoint.
 - III. On a ray, there are many points given distance from the endpoint to the ray.

a. I only	c. III only
b. II only	d. I and II only
 3. What is the value of x in the diagram shown?
a. 22
b. 20
c. 44

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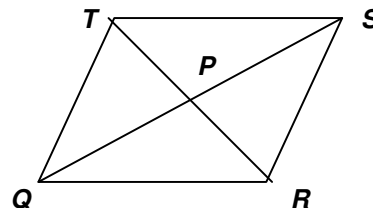
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9. In the figure to the right, QRST is a parallelogram. If $m\angle TQR = 85^\circ$, then what is $m\angle TSR$?

- a. 115°
- b. 105°
- c. 95°
- d. 85°

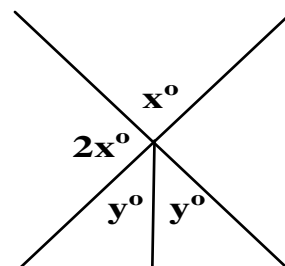


10. From the figure above, what is the value of x if $TP = 2x + 1$; $SP = 4 - 3y$; $RP = y + 5$; $QP = x - 4$?

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

11. In the figure at the right, what is the value of y ?

- a. 60°
- b. 45°
- c. 30°
- d. cannot be determined



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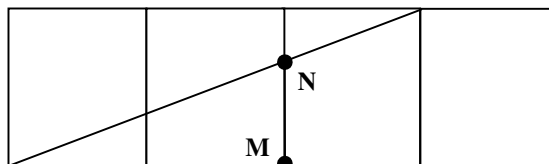
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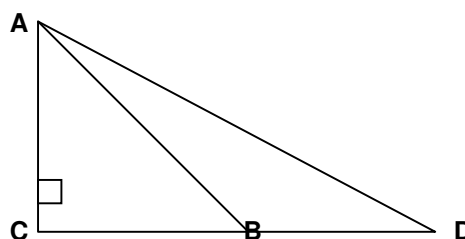
12. In the figure, the side of each small square is 27 centimeters. What is the length of MN ?

- a. 15 cm
- b. 18 cm
- c. 21 cm
- d. 24 cm



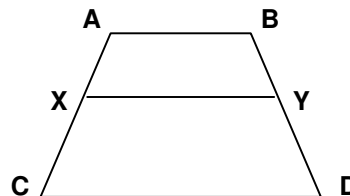
13. Given the figure, $\overline{AB} = \overline{CD}$; $\overline{AC} = \overline{BC} = 4$. What is \overline{AD} ?

- a. $4\sqrt{3}$
- b. $4\sqrt{2}$
- c. $4 + 2\sqrt{2}$
- d. $4 + 2\sqrt{3}$



14. ABCD is a trapezoid with $\overline{AB} \parallel \overline{CD}$, \overline{XY} is the median. If $\overline{AB} = 6$ and $\overline{XY} = 13$, then what is the length of \overline{CD} ?

- a. 16
- b. 18
- c. 20
- d. 22



15. If the lengths of the sides of a square are doubled, what is the effect on the area?
- a. The area will increase twice.
 - b. The area will increase 4 times.
 - c. The area will increase 8 times.
 - d. The area will remain the same.
16. A rectangular solid with dimensions 2, 12, and q has the same volume as a cube with an edge length of 6. What is the value of q ?
- a. 11
 - b. 9
 - c. 7
 - d. 5
17. Given three squares of different areas, the perimeter of square A is $\frac{2}{3}$ the perimeter of square B, and the perimeter of square B is $\frac{2}{3}$ the perimeter of square C. If the area of square A is 16 square units, what is the area of square C?



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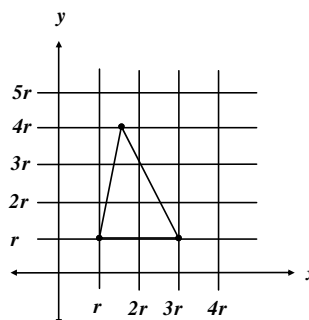
- a. 81
b. 72
- c. 64
d. 36

18. What is the area of the kite whose diagonals have lengths 12 and 7?

- a. 24
b. 30
- c. 40
d. 42

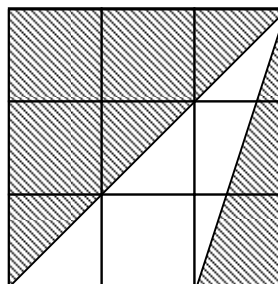
19. The area of the triangle in the figure at the right is 12, then what is the value of r ?

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



20. In the diagram, each small square is 1 cm by 1 cm. What is the area of the non-shaded region?

- a. 6
b. 4.5
c. 3
d. 2.75

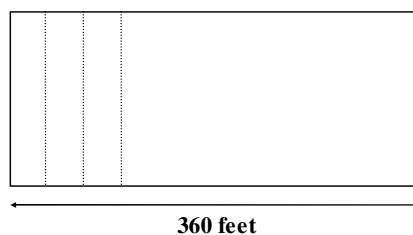


21. An equilateral triangle has the same perimeter as a square. What is the area of the square if the triangle has side equal to 16?

- a. 144
b. 169
- c. 100
d. 81

22. The figure at the right shows a rectangular parcel of land divided into lots of equal size, as shown by the dotted lines. If the area of three of the lots is equal to one-fourth of the total area in the parcel, then how many feet wide is each lot?

- a. 30
b. 60
c. 40
d. 90





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23. Convert 225° to radians:

a. $\frac{9\pi}{4}$

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

c. $\frac{7\pi}{6}$

d. $\frac{5\pi}{4}$

24. Convert $\frac{11\pi}{6}$ to degrees:

a. 280°

b. 300°

c. 330°

d. 360°

25. Find $\tan \theta$ if $\sin \theta = 2/3$ and θ is not in the first quadrant

a. $-\sqrt{5}/3$

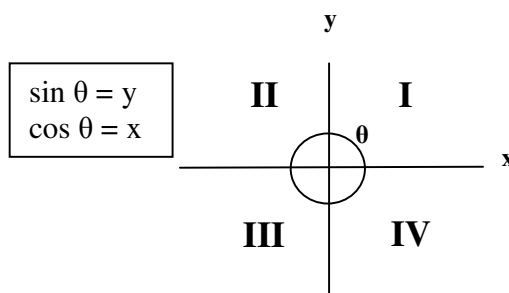
b. $-\sqrt{5}/2$

c. $-2/\sqrt{5}$

d. $-3/\sqrt{5}$

26. In the coordinate system given, in which quadrant is $\sin \theta$ positive and $\cos \theta$ negative?

- a. I
b. II
c. III
d. IV



27. $\frac{\sqrt{1-\sin^2 \theta}}{\sin \theta}$ is equal to

- a. $\cos \theta$
b. $\sec \theta$

- c. $\csc \theta$
d. $\cot \theta$

28. What is the height of Quezon City Hall if the shadow of the building is 20 meters and the angle of elevation of the sun is 30° ?

a. $\frac{20\sqrt{3}}{3}$

b. $\frac{\sqrt{3}}{20}$

c. $\frac{2\sqrt{3}}{3}$

d. $\frac{\sqrt{3}}{3}$



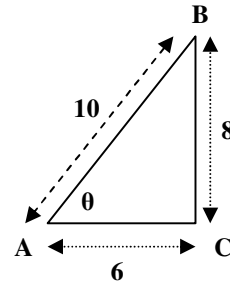
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For nos. 29-30:

29. In the right triangle ABC, what is the value of $\cos \theta$?

- a. $4/5$
- b. $3/4$
- a. $5/3$
- b. $3/5$



30. In the same figure above, what is the value of $\tan \theta$?

- a. $4/5$
- a. $5/3$
- c. $3/4$
- d. $4/3$