1. Solve: $x - (15x - 6) = 104$

A) $\dfrac{-55}{7}$ B) $\dfrac{-49}{8}$ C) $\dfrac{-55}{8}$ D) -7 E) NOTA

2. If $y = 3$, then $-y^2 =$

A) -36 B) -18 C) -9 D) 9 E) 6

3. Solve for r: $A = p + prt$

A) $\dfrac{A}{1+tp}$ B) $t(A - p)$ C) $\dfrac{A - p}{pt}$

D) $\dfrac{pt}{A - p}$ E) NOTA

4. $(4x - 3)(x - 4) =$

A) $4x^2 + 19x + 12$ B) $4x^2 - 7$ C) $4x^2 + 12$

D) $4x^2 - 19x - 12$ E) NOTA

5. Find the distance between P(-4, 6) and Q(-2,-8)

A) $2\sqrt{58}$ B) $2\sqrt{10}$ C) $10\sqrt{2}$ D) $4\sqrt{58}$ E) NOTA

6. Factor: $16x^2 - a^2 =$

A) $(4x - a)^2$ B) $(4x + a)^2$ C) $(16x - a)^2$

D) $(4x - a)(x + a)$ E) $(4x - a)(4x + a)$

7. Given the measure of angle A is 33°. Find the sum of the measures of the complementary angle, supplementary angle and vertical angle for angle A.

A) 257°   B) 237°   C) $\dfrac{247}{3}°$ D) 279°   E) NOTA

8. One of the solutions of the equation $x^2 - x = 12$ is:

A) −12   B) − 4   C) 4   D) 3   E) NOTA

9. Find the area of a circle with circumference 32π

A) 228π   B) 256π   C) 16π   D) 16   E) NOTA

10. The value of $3^{-2} + 2^{-3}$ is:

A) -1   B) $\dfrac{1}{17}$ C) $\dfrac{17}{72}$ D) $\dfrac{1}{72}$ E) NOTA

11. Solve: $15 + 10x > -4x + 3$

A) $x > -\dfrac{9}{7}$ B) $x < -\dfrac{6}{7}$ C) $x < -6$

D) $x > -\dfrac{6}{7}$ E) NOTA

12. The perimeter of a rectangle is 28 in. If its length is 9 in., find its area.

A) 6 sq. in.   B) 45 sq. in.   C) 90 sq. in.   D) 2.5 sq. in.   E) NOTA

13. Solve the equations $2(m + 5) = -25$ and $4(2 - n) - 2 = 41$. What is the sum of the solutions for m and n?
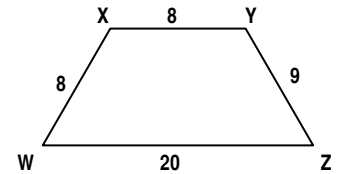
A) 17   B) -35   C) $-\dfrac{35}{2}$ D) $-\dfrac{35}{4}$ E) $-\dfrac{105}{4}$

14. If $x + y = 6$ and $x = y + 2$, then find the numerical value of y.

 A) 1 B) 2 C) 3 D) 4 E) NOTA

15. If you choose a random point on a side of the trapezoid, what is the probability that it is on WZ?

 A) $\dfrac{1}{45}$ B) $\dfrac{4}{5}$ C) $\dfrac{8}{45}$ D) $\dfrac{4}{9}$ E) $\dfrac{5}{9}$

16. Find the equation of the line containing the point $(-3, -12)$ and having slope: -4.

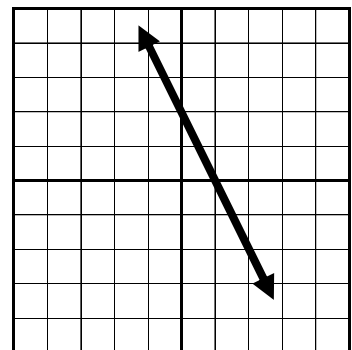 A) $y = -4x$ B) $y = 4x$ C) $y = -4x - 24$

 D) $y = 3x - 4$ E) NOTA

17. Find the middle term to make this polynomial factorable:

 $x^2 +$ _____ $+ 10$

 A) 12x B) 13x C) 7x D) 3x E) - 10x

18. Which equation is graphed to the right?

 A) $x + y = 2$ B) $2x - y = 3$ C) $2x + y = 3$

 D) $2x - y = 5$ E) NOTA

19. A boy is mowing a rectangular lawn 40 ft. long and 30 ft. wide. He has cut all of it except for a rectangle that is 20 ft. long and 15 ft. wide. What fractional part of the lawn remains uncut?

 A) $\dfrac{1}{4}$ B) $\dfrac{9}{40}$ C) $\dfrac{7}{240}$ D) $\dfrac{1}{2}$ E) NOTA

20. Factor completely: $18x^3 - 63x^2 + 9x =$

A) $9\,(2x^3 - 7x^2 + x)$ B) $9x\,(2x^2 - 7x)$

C) $9x\,(2x^2 - 7x + x)$ D) $9x\,(2x^2 - 7x + 1)$

E) $9x\,(2x - 1)(x - 3)$

21. Find the equation of the perpendicular bisector between K(3, -6) and L(10, 17)

A) $23x - 7y = 138$ B) $7x + 23y = 461$

C) $23x - 7y = 54$ D) $11x - 7y = -9$

E) NOTA

22. In the figure to the right, the circle is centered at the origin and passes through point P (0, -3). Which of the following points does it also pass through?
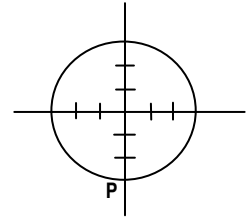
A) (3, 3)   B) $\left(-2\sqrt{2}, -1\right)$ C) (2, 6)

D) (1.5, 1.3)   E)   (-3, 4)

23. Find the center and radius of the circle whose equation is:
$x^2 + (y - 3)^2 = 10$

A) center (0, -3)   radius = 10
B) center (1, 3)   radius = 5
C) center (0, 3)   radius = $\sqrt{10}$
D) center (0, -3) radius = $\sqrt{10}$
E)   center (0, 3)   radius = 5

24. Find the geometric mean between 8 and ¼
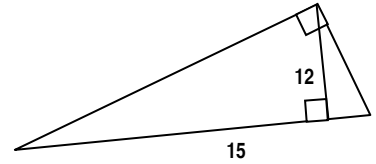
A) $\sqrt{2}$ B) $\dfrac{1}{2}$ C) $\dfrac{\sqrt{2}}{2}$ D) 2   E) 16

25. Find the volume of a cylinder that has a diameter of 12 in. and a height of 15 in.

A) 2160π B) 90π C) 540π D) 2700π E) NOTA

26. Find the area of a right triangle with hypotenuse 15 in. and altitude 12 in. (to the hypotenuse).

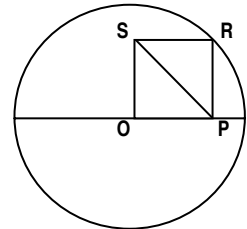A) 90 in^2 B) 180 in^2 C) 54 in^2 D) 108 in^2 E) NOTA

12

15

27. Given A(0, 2), B(5, 5), and C(7, 2). Reflect $\triangle$ABC over the x-axis. Give the coordinates of the vertices of the image.

  A) A'(0, 2) B'(-5, 5) C'(-7, 2)
  B) A'(-2, 0) B'(-5, 5) C'(-2, 7)
  C) A'(0, -2) B'(5, -5) C'(7, -2)
  D) A'(2, 0) B'(5, 5) C'(2, 7)
  E) NOTA

28. In the figure to the right, O is both the center of the circle with radius 2 and a vertex of the square OPRS. What is the length of diagonal PS?
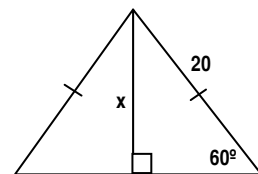
(A) 1/2   (B) 1   (C) 4   (D) 2   (E) 2/3

S   R

O   P

29. In the diagram at the right, m$\angle$BCE is 144°. Find m$\angle$ECD.

A) 72°   B) 20°   C) 42°   D) 144°   E) NOTA

(3x+12)°   D
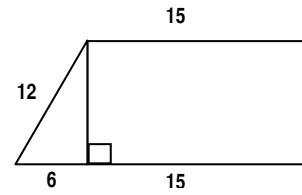
E

(2x+32)°

B   C
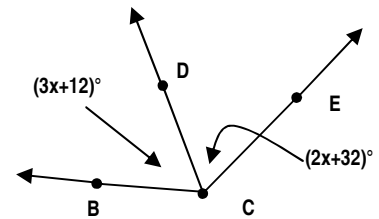
30. Find the exact value of x.

A) 10   B) $10\sqrt{3}$ C) 5   D) $5\sqrt{3}$ E) NOTA
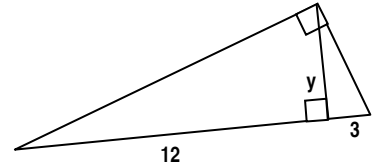
20

x

60º

31. Find the area of the trapezoid.

A) 432   B) $6\sqrt{3}$ C) $126\sqrt{3}$ D) $108\sqrt{3}$ E) NOTA
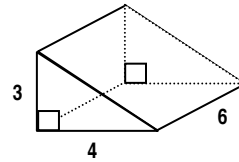
32. Find the exact value of y:

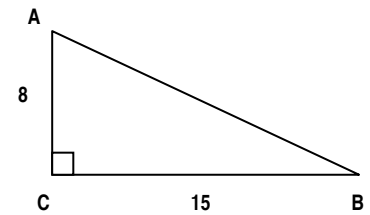A) $3\sqrt{3}$ B) 6   C) 36   D) $6\sqrt{5}$ E) NOTA

33. Find the volume of the prism.

A) 13   B) 84   C) 30   D) 72   E) NOTA

34. Find cos A

A) $\dfrac{8}{15}$ B) $\dfrac{15}{8}$ C) $\dfrac{15}{17}$ D) $\dfrac{8}{17}$ E) NOTA
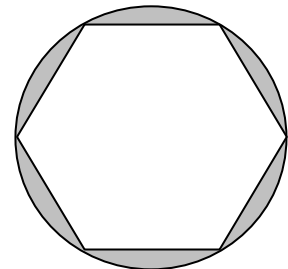
35. Give the most <u>specific</u> name for the polygon with vertices (5,-2), (4,2), (0,3), and (1,-1)

A) parallelogram   B) rectangle
C) square   D) rhombus
E) quadrilateral

36. Find the area of the shaded region (a regular hexagon inscribed in the circle with a radius of 6)

A) 54 - 36π   B) 36π - 108   C) 6π
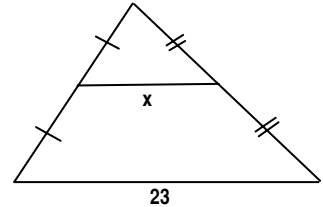
D) $108\pi^2$ E) $36\pi - 54\sqrt{3}$

37. Suppose △ABC~△PQR with AB:PQ = 5:9
What is the ratio of the area of △ABC to △PQR?

A) 125:729   B) 5:9   C) 25:81   D) 2:3   E) NOTA
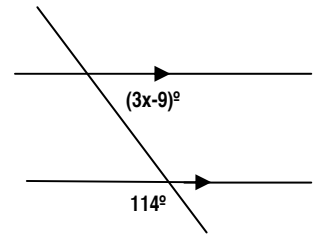
38. Find the value of x.

A) 11.5   B) 23   C) 46   D) $\dfrac{23}{3}$ E) Not enough information
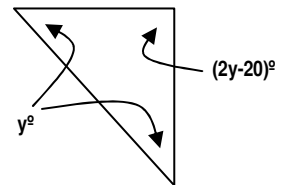
39. Find the value of x.

A) 16   B) 41   C) 5   D) 25   E) 66
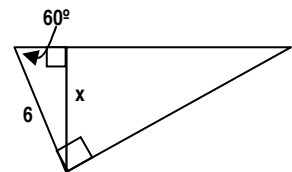
40.
Find the value of y.

A) 50   B) 55   C) 40   D) $\dfrac{200}{3}$ E) 45
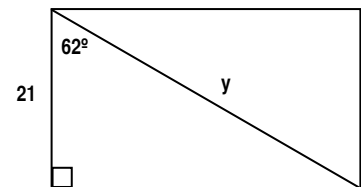
41.
Find the value of x.

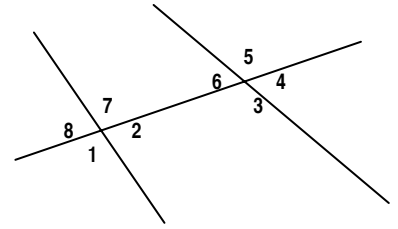A) 3   B) $3\sqrt{3}$ C) $6\sqrt{3}$ D) $3\sqrt{2}$ E) $2\sqrt{3}$

42.
Find the value of y.

A) 44.7   B) 9.9   C) 23.8   D) 34.1   E) NOTA

43. Which of these are a pair of same-side interior angles?
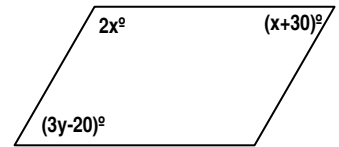
A) 7, 3   B) 2, 3   C) 1, 3   D) 5, 3   E) NOTA

44. Find the value of x and y that will make this a parallelogram.

A) $x = 45$, $y = \dfrac{110}{3}$

B) $x = 50$, $y = \dfrac{100}{3}$

C) $x = 50$, $y = 20$

D) $x = 50$, $y = 60$

E) NOTA

45. The lengths of two sides of a triangle are 6 and 3. What do you know about the third side?

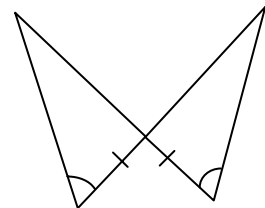A) It's between 6 and 9   B) It's less than 6

C) It's between 3 and 9   D) It's less than 9

E) NOTA

46. Which method can be used to prove that these two triangles are congruent?

A) HL   B) SAS   C) SSS   D) ASA   E) NOTA

47. What kind of polygon has angle measures that add up to 1440°?

A) Hexagon   B) Heptagon   C) Decagon
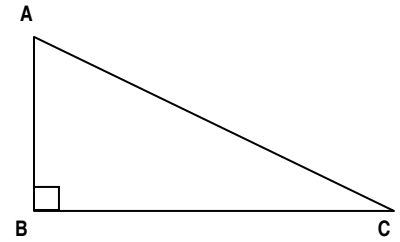
D) Dodecagon   E) NOTA

For problems 48-50:

Fill-in the blanks for a two-column proof of the theorem:
The two acute angles of a right triangle are complementary.

Given: In $\triangle ABC$, $\angle B$ is a right angle
Prove: $\angle A$ and $\angle C$ are complementary

Statements:	Reasons:
1. In $\triangle ABC$, $\angle B$ is a right angle.	1. Given
2. $m\angle B = 90°$	2. _____#48_____
3. $m\angle A + m\angle B + m\angle C = 180°$	3. _____#49_____
4. $m\angle A + 90° + m\angle C = 180°$	4. Substitution (steps 2 & 3)
5. $m\angle A + m\angle C = 90°$	5. Subtraction Property
6. $\angle A$ and $\angle C$ are complementary	6. _____#50_____

48. Choose from:

   A) Triangle Sum Theorem
   B) Definition of a right angle
   C) Definition of congruent angles
   D) Linear Pair Theorem
   E) Definition of complementary angles

49. Choose from:

   A) Triangle Sum Theorem
   B) Definition of a right angle
   C) Definition of congruent angles
   D) Linear Pair Theorem
   E) Definition of complementary angles

50. Choose from:

   A) Triangle Sum Theorem
   B) Definition of a right angle
   C) Definition of congruent angles
   D) Linear Pair Theorem
   E) Definition of complementary angles

1	D	26	A
2	C	27	C
3	C	28	D
4	E	29	A
5	C	30	B
6	E	31	D
7	B	32	B
8	C	33	E
9	B	34	D
10	C	35	D
11	D	36	E
12	B	37	C
13	E	38	A
14	B	39	D
15	D	40	A
16	C	41	B
17	C	42	A
18	E	43	B
19	A	44	B
20	D	45	C
21	E	46	D
22	B	47	C
23	C	48	B
24	A	49	A
25	C	50	E