

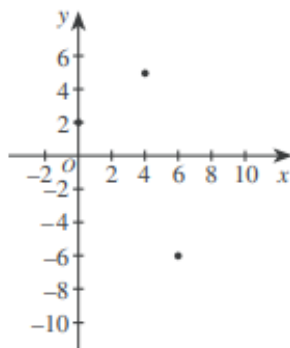
ACT Practice Set Problems – HW #5

2**2**

9. In the standard (x,y) coordinate plane, point M with coordinates $(5,4)$ is the midpoint of \overline{AB} , and B has coordinates $(7,3)$. What are the coordinates of A ?

A. $(17,11)$
 B. $(9, 2)$
 C. $(6, 3.5)$
 D. $(3, 5)$
 E. $(-3,-5)$

10. Rectangle $ABCD$ has vertices $A(4,5)$, $B(0,2)$, and $C(6,-6)$. These vertices are graphed below in the standard (x,y) coordinate plane. What are the coordinates of vertex D ?



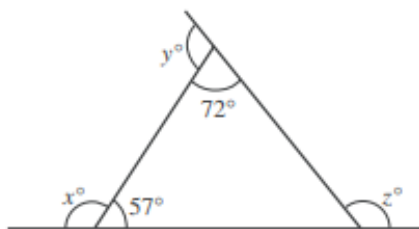
F. $(10,-3)$
 G. $(9,-2)$
 H. $(8, 2)$
 J. $(7, 1)$
 K. $(2,-9)$

11. Daisun owns 2 sportswear stores (X and Y). She stocks 3 brands of T-shirts (A, B, and C) in each store. The matrices below show the numbers of each type of T-shirt in each store and the cost for each type of T-shirt. The value of Daisun's T-shirt inventory is computed using the costs listed. What is the total value of the T-shirt inventory for Daisun's 2 stores?

	A	B	C	Cost
X	100	200	150	A \$ 5
Y	120	50	100	B \$10
				C \$15

A. \$2,200
 B. \$2,220
 C. \$4,965
 D. \$5,450
 E. \$7,350

12. Given the triangle shown below with exterior angles that measure x° , y° , and z° as shown, what is the sum of x , y , and z ?



F. 180
 G. 231
 H. 309
 J. 360
 K. Cannot be determined from the given information

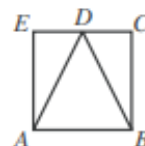
Use the following information to answer questions 13–15.

A poll of 200 registered voters was taken before the election for mayor of Springdale. All 200 voters indicated which 1 of the 4 candidates they would vote for. The results of the poll are given in the table below.

Candidate	Number of voters
Blackcloud	50
Lue	80
Gomez	40
Whitney	30

13. What percent of the voters polled chose Whitney in the poll?
 A. 15%
 B. 20%
 C. 25%
 D. 30%
 E. 40%
14. If the poll is indicative of how the 10,000 registered voters of Springdale will actually vote in the election, which of the following is the best estimate of the number of votes Lue will receive in the election?
 F. 1,500
 G. 2,500
 H. 4,000
 J. 5,000
 K. 8,000
15. If the information in the table were converted into a circle graph (pie chart), then the central angle of the sector for Gomez would measure how many degrees?
 A. 54°
 B. 72°
 C. 90°
 D. 108°
 E. 144°

16. In square $ABCE$ shown below, D is the midpoint of \overline{CE} . Which of the following is the ratio of the area of $\triangle ADE$ to the area of $\triangle ADB$?

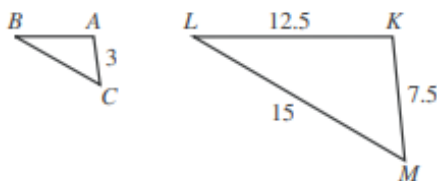


F. 1:1
 G. 1:2
 H. 1:3
 J. 1:4
 K. 1:8



25. In the figure below, where $\triangle ABC \sim \triangle KLM$, lengths given are in centimeters. What is the perimeter, in centimeters, of $\triangle ABC$?

(Note: The symbol \sim means "is similar to.")



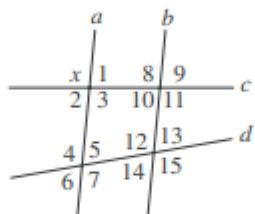
- A. 12
B. 14
C. $21\frac{1}{2}$
D. 35
E. $71\frac{3}{4}$
26. If $\frac{3\sqrt{7}}{a\sqrt{7}} = \frac{3\sqrt{7}}{7}$ is true, then $a =$?
- F. 1
G. $\sqrt{7}$
H. 7
J. 21
K. 49
27. A hot-air balloon 70 meters above the ground is falling at a constant rate of 6 meters per second while another hot-air balloon 10 meters above the ground is rising at a constant rate of 15 meters per second. To the nearest tenth of a second, after how many seconds will the 2 balloons be the same height above the ground?
- A. 8.9
B. 6.7
C. 2.9
D. 0.4
E. 0.2
28. A hiking group will go from a certain town to a certain village by van on 1 of 4 roads, from the village to a waterfall by riding bicycles on 1 of 2 bicycle paths, and then from the waterfall to their campsite by hiking on 1 of 6 trails. How many routes are possible for the hiking group to go from the town to the village to the waterfall to their campsite?
- F. 6
G. 12
H. 24
J. 48
K. 220
29. Cube A has an edge length of 2 inches. Cube B has an edge length double that of Cube A. What is the volume, in cubic inches, of Cube B?
- A. 4
B. 8
C. 16
D. 32
E. 64
30. A formula used to compute the current value of a savings account is $A = P(1 + r)^n$, where A is the current value; P is the amount deposited; r is the rate of interest for 1 compounding period, expressed as a decimal; and n is the number of compounding periods. Which of the following is closest to the value of a savings account after 5 years if \$10,000 is deposited at 4% annual interest compounded yearly?
- F. \$10,400
G. \$12,167
H. \$42,000
J. \$52,000
K. \$53,782
31. A right circular cylinder is shown in the figure below, with dimensions given in centimeters. What is the total surface area of this cylinder, in square centimeters?
- (Note: The total surface area of a cylinder is given by $2\pi r^2 + 2\pi rh$ where r is the radius and h is the height.)
-
- A. 300π
B. 400π
C. 500π
D. 600π
E. $1,600\pi$
32. Given $f(x) = 4x + 1$ and $g(x) = x^2 - 2$, which of the following is an expression for $f(g(x))$?
- F. $-x^2 + 4x + 1$
G. $x^2 + 4x - 1$
H. $4x^2 - 7$
J. $4x^2 - 1$
K. $16x^2 + 8x - 1$



33. The table below shows the total number of goals scored in each of 43 soccer matches in a regional tournament. What is the average number of goals scored per match, to the nearest 0.1 goal?

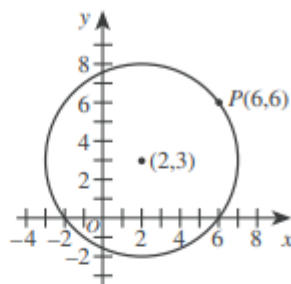
Total number of goals in a match	Number of matches with this total
0	4
1	10
2	5
3	9
4	7
5	5
6	1
7	2

- A. 1.0
 B. 2.8
 C. 3.0
 D. 6.1
 E. 17.1
34. Lines a , b , c , and d are shown below and $a \parallel b$. Which of the following is the set of all angles that *must* be supplementary to $\angle x$?

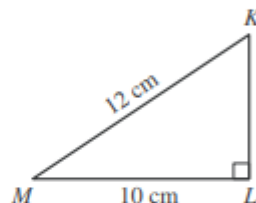


- F. $\{1, 2\}$
 G. $\{1, 2, 5, 6\}$
 H. $\{1, 2, 9, 10\}$
 J. $\{1, 2, 5, 6, 9, 10\}$
 K. $\{1, 2, 5, 6, 9, 10, 13, 14\}$
35. $(3x^3)^3$ is equivalent to:
- A. x
 B. $9x^6$
 C. $9x^9$
 D. $27x^6$
 E. $27x^9$
36. Which of the following is equivalent to the inequality $4x - 8 > 8x + 16$?
- F. $x < -6$
 G. $x > -6$
 H. $x < -2$
 J. $x > 2$
 K. $x < 6$

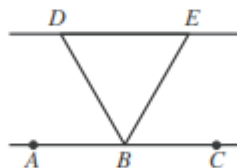
37. As shown in the standard (x,y) coordinate plane below, $P(6,6)$ lies on the circle with center $(2,3)$ and radius 5 coordinate units. What are the coordinates of the image of P after the circle is rotated 90° clockwise (\curvearrowright) about the center of the circle?



- A. $(2, 3)$
 B. $(3, 2)$
 C. $(5, -1)$
 D. $(6, 0)$
 E. $(7, 3)$
38. For right triangle $\triangle KLM$ below, what is $\sin \angle M$?



- F. $\frac{10}{12}$
 G. $\frac{12}{10}$
 H. $\frac{\sqrt{44}}{10}$
 J. $\frac{10}{\sqrt{44}}$
 K. $\frac{\sqrt{44}}{12}$
39. In the figure below, B lies on \overline{AC} , \overline{BD} bisects $\angle ABE$, and \overline{BE} bisects $\angle CBD$. What is the measure of $\angle DBE$?



- A. 90°
 B. 60°
 C. 45°
 D. 30°
 E. Cannot be determined from the given information
40. If there are 8×10^{12} hydrogen molecules in a volume of 4×10^4 cubic centimeters, what is the average number of hydrogen molecules per cubic centimeter?
- F. 5×10^{-9}
 G. 2×10^3
 H. 2×10^8
 J. 32×10^{16}
 K. 32×10^{48}