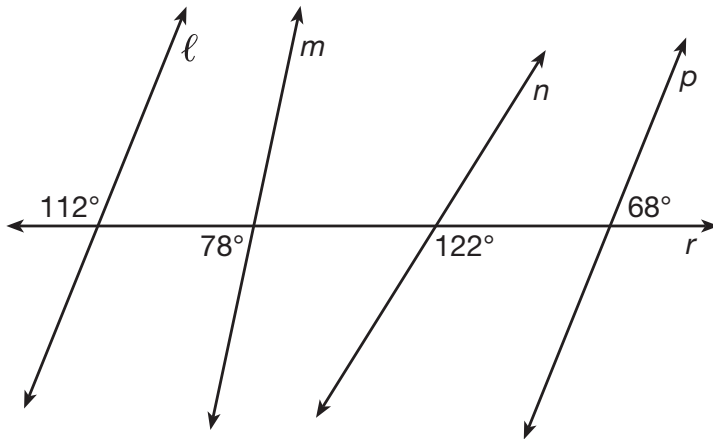


Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers on your separate answer sheet. [48]

1 In the diagram below, lines ℓ , m , n , and p intersect line r .

Use this space for computations.



Which statement is true?

- | | |
|------------------------|---------------------|
| (1) $\ell \parallel n$ | (3) $m \parallel p$ |
| (2) $\ell \parallel p$ | (4) $m \parallel n$ |

2 Which transformation would *not* always produce an image that would be congruent to the original figure?

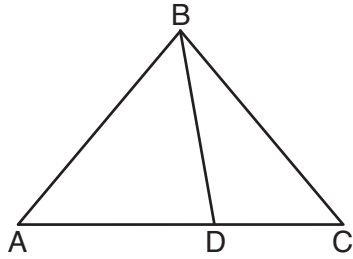
- | | |
|-----------------|----------------|
| (1) translation | (3) rotation |
| (2) dilation | (4) reflection |

3 If an equilateral triangle is continuously rotated around one of its medians, which 3-dimensional object is generated?

- | | |
|-------------|------------|
| (1) cone | (3) prism |
| (2) pyramid | (4) sphere |

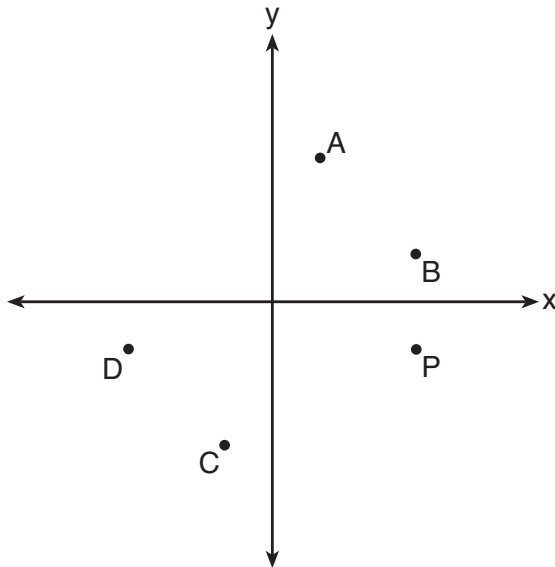
Use this space for
computations.

- 4 In the diagram below, $m\angle BDC = 100^\circ$, $m\angle A = 50^\circ$, and $m\angle DBC = 30^\circ$.



Which statement is true?

- (1) $\triangle ABD$ is obtuse. (3) $m\angle ABD = 80^\circ$
(2) $\triangle ABC$ is isosceles. (4) $\triangle ABD$ is scalene.
- 5 Which point shown in the graph below is the image of point P after a counterclockwise rotation of 90° about the origin?



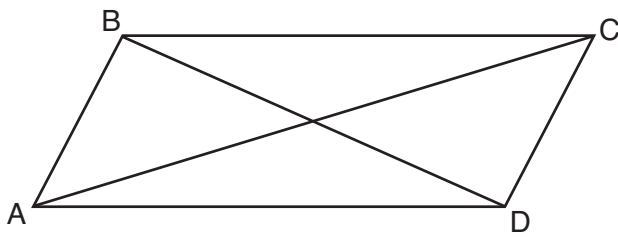
- (1) A (3) C
(2) B (4) D

Use this space for computations.

6 In $\triangle ABC$, where $\angle C$ is a right angle, $\cos A = \frac{\sqrt{21}}{5}$. What is $\sin B$?

- (1) $\frac{\sqrt{21}}{5}$ (3) $\frac{2}{5}$
(2) $\frac{\sqrt{21}}{2}$ (4) $\frac{5}{\sqrt{21}}$

7 Quadrilateral $ABCD$ with diagonals \overline{AC} and \overline{BD} is shown in the diagram below.

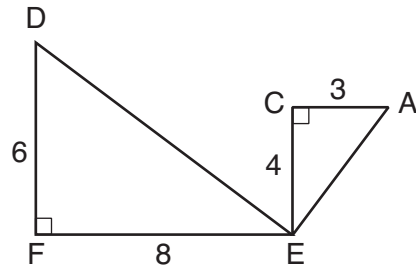


Which information is *not* enough to prove $ABCD$ is a parallelogram?

- (1) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{DC}$
(2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$
(3) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$
(4) $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \parallel \overline{AD}$
- 8 An equilateral triangle has sides of length 20. To the *nearest tenth*, what is the height of the equilateral triangle?
- (1) 10.0 (3) 17.3
(2) 11.5 (4) 23.1

Use this space for computations.

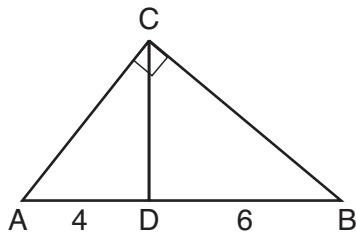
9 Given: $\triangle AEC$, $\triangle DEF$, and $\overline{FE} \perp \overline{CE}$



What is a correct sequence of similarity transformations that shows $\triangle AEC \sim \triangle DEF$?

- (1) a rotation of 180 degrees about point E followed by a horizontal translation
- (2) a counterclockwise rotation of 90 degrees about point E followed by a horizontal translation
- (3) a rotation of 180 degrees about point E followed by a dilation with a scale factor of 2 centered at point E
- (4) a counterclockwise rotation of 90 degrees about point E followed by a dilation with a scale factor of 2 centered at point E

10 In the diagram of right triangle ABC , \overline{CD} intersects hypotenuse \overline{AB} at D .



If $AD = 4$ and $DB = 6$, which length of \overline{AC} makes $\overline{CD} \perp \overline{AB}$?

- | | |
|------------------|------------------|
| (1) $2\sqrt{6}$ | (3) $2\sqrt{15}$ |
| (2) $2\sqrt{10}$ | (4) $4\sqrt{2}$ |