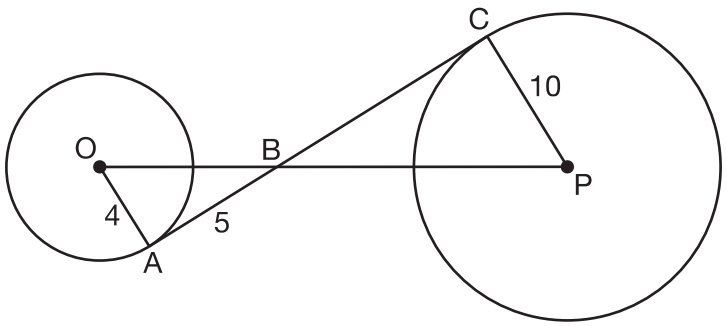
Use this space for computations.

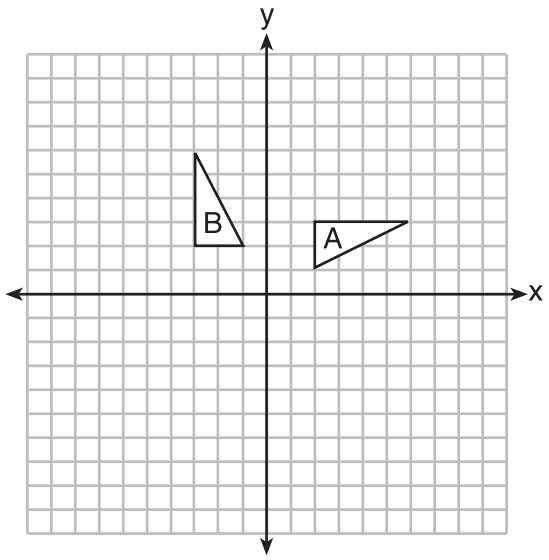
12 In the diagram shown below, $\overline{AC}$ is tangent to circle O at A and to circle P at C, $\overline{OP}$ intersects $\overline{AC}$ at B, $OA = 4$, $AB = 5$, and $PC = 10$.



What is the length of $\overline{BC}$?

(1) 6.4
(2) 8
(3) 12.5
(4) 16

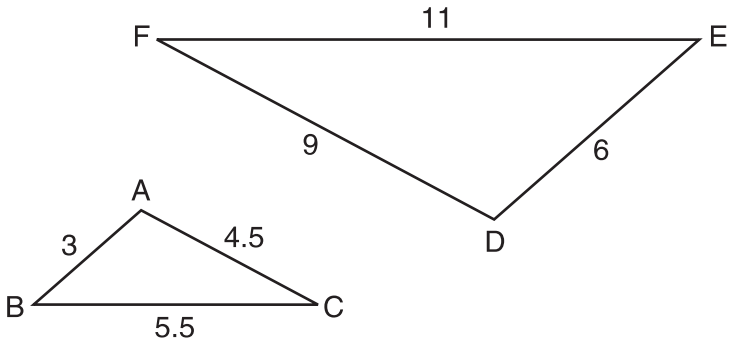
13 In the diagram below, which single transformation was used to map triangle A onto triangle B?



(1) line reflection
(2) rotation
(3) dilation
(4) translation

Use this space for computations.

14 In the diagram below, $\triangle DEF$ is the image of $\triangle ABC$ after a clockwise rotation of 180° and a dilation where $AB = 3$, $BC = 5.5$, $AC = 4.5$, $DE = 6$, $FD = 9$, and $EF = 11$.



Which relationship must always be true?

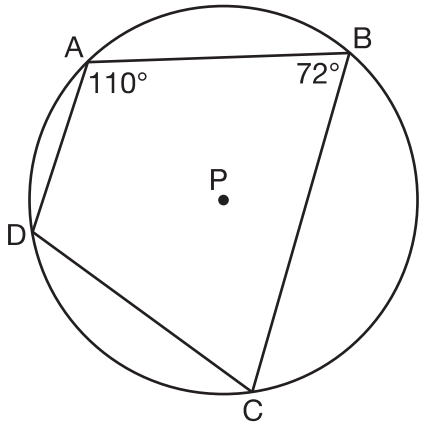
(1) $\frac{m\angle A}{m\angle D} = \frac{1}{2}$

(2) $\frac{m\angle C}{m\angle F} = \frac{2}{1}$

(3) $\frac{m\angle A}{m\angle C} = \frac{m\angle F}{m\angle D}$

(4) $\frac{m\angle B}{m\angle E} = \frac{m\angle C}{m\angle F}$

15 In the diagram below, quadrilateral $ABCD$ is inscribed in circle P.



What is $m\angle ADC$?

(1) 70°

(2) 72°

(3) 108°

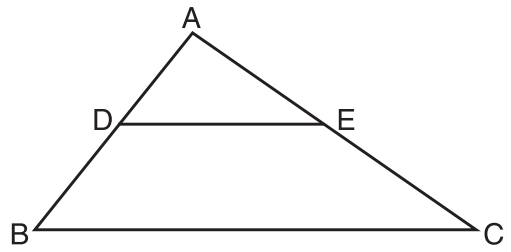
(4) 110°

Use this space for computations.

16 A hemispherical tank is filled with water and has a diameter of 10 feet. If water weighs 62.4 pounds per cubic foot, what is the total weight of the water in a full tank, to the *nearest pound*?

(1) 16,336
(2) 32,673
(3) 130,690
(4) 261,381

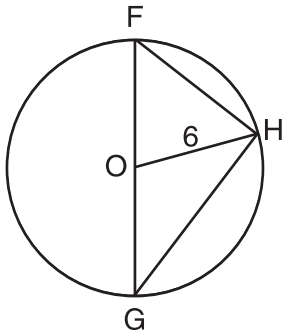
17 In the diagram below, $\triangle ABC \sim \triangle ADE$.



Which measurements are justified by this similarity?

(1) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
(2) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
(3) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
(4) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$

18 Triangle FGH is inscribed in circle O, the length of radius $\overline{OH}$ is 6, and $\overline{FH} \cong \overline{OG}$.

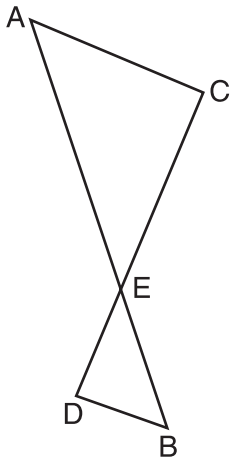


What is the area of the sector formed by angle FOH?

(1) 2π
(2) $\frac{3}{2}\pi$
(3) 6π
(4) 24π

Use this space for computations.

19 As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.



Given $\triangle AEC \sim \triangle BED$, which equation is true?

(1) $\frac{CE}{DE} = \frac{EB}{EA}$

(2) $\frac{AE}{BE} = \frac{AC}{BD}$

(3) $\frac{EC}{AE} = \frac{BE}{ED}$

(4) $\frac{ED}{EC} = \frac{AC}{BD}$

20 A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?

(1) The area of the image is nine times the area of the original triangle.

(2) The perimeter of the image is nine times the perimeter of the original triangle.

(3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.

(4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

21 The Great Pyramid of Giza was constructed as a regular pyramid with a square base. It was built with an approximate volume of 2,592,276 cubic meters and a height of 146.5 meters. What was the length of one side of its base, to the *nearest meter*?

(1) 73

(2) 77

(3) 133

(4) 230