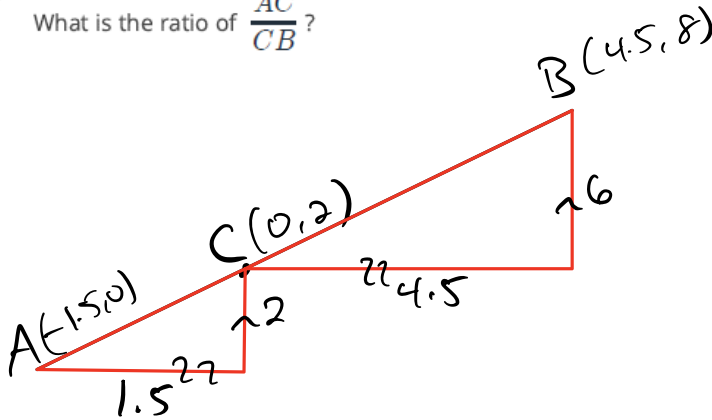


2022 Review Exam Q3 Part 1

- 1 Line segment  $AB$  has endpoints  $A(-1.5, 0)$  and  $B(4.5, 8)$ . Point  $C$  is on line segment  $AB$  and is located at  $(0, 2)$ . What is the ratio of  $\frac{AC}{CB}$ ?

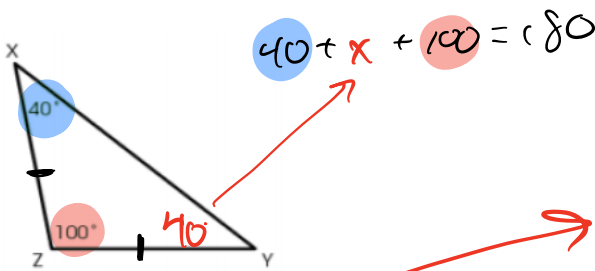


$$\frac{AC}{CB} = \frac{2}{6}$$

or

$$\frac{AC}{CB} = \frac{1.5}{4.5}$$

- 2 Triangle  $XYZ$  is shown.



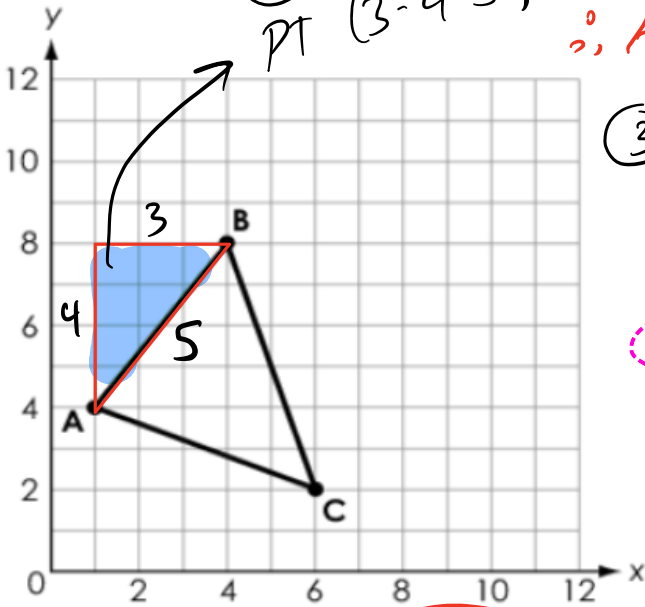
Corresponding sides proportional  
Corresponding angles congruent

Which triangle must be similar to triangle  $XYZ$ ?

- (A) a triangle with two angles that measure  $40^\circ$   $40 + 40 + 100 = 180^\circ$
- (B) a triangle with angles that measure  $40^\circ$  and  $60^\circ$   $40 + 60 + 100 \neq 180$
- (C) a scalene triangle with only one angle that measures  $100^\circ$  → False
- (D) an isosceles triangle with only one angle that measures  $40^\circ$   $40 + 100 + 100 \neq 180$

3

Triangle  $ABC$  is shown.



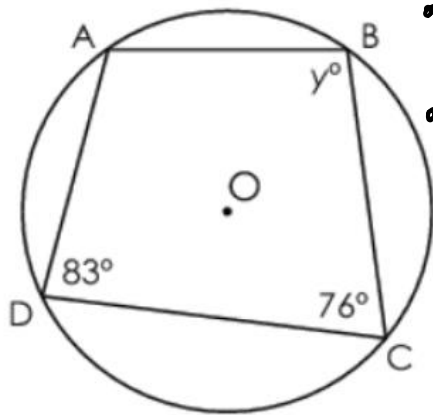
(3)  
 $A'B' = AB \cdot 4$   
 $= 5 \cdot 4$   
 $A'B' = 20$

Triangle  $A'B'C'$  is created by dilating  $\triangle ABC$  by 4.  
 What is the length of  $\overline{A'B'}$ ?

(1) → multiply by 4  
 $\therefore k = 4$

4

Quadrilateral  $ABCD$  is inscribed in circle  $O$ , as shown.



- $ABCD$  is a cyclic Quadrilateral
- A cyclic quad's opposite angles supple.

$\therefore 83 + y = 180$

$y = 97$

→ All vertices are on circle.

What is the value of  $y$ ?

5 Angle  $A$  is the complement of angle  $B$ .  
Which equation about the two angles must be true?

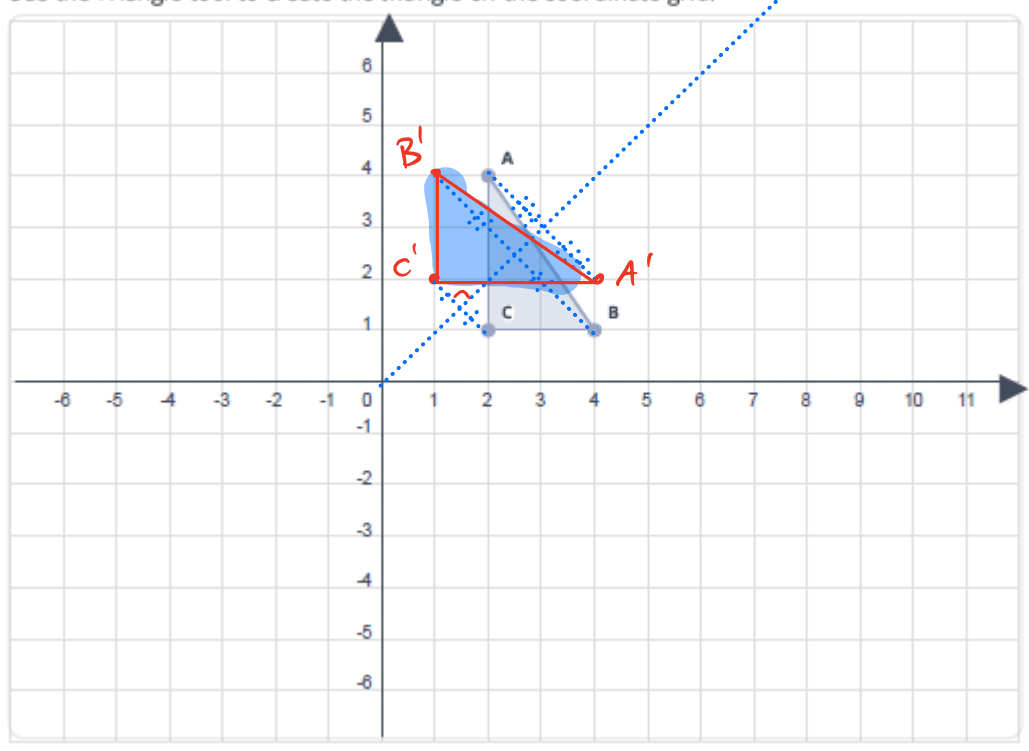
- (A)  $\sin A = \sin B$
- (B)  $\sin A = \cos A$
- (C)  $\cos B = \sin B$
- (D)  $\cos A = \sin B$

$\sin A = \cos B$   
AND  
 $\sin B = \cos A$

6 The equation of a circle is shown.  
 $x^2 + y^2 - 10x + 8y + 16 = 0$   
What is the radius of the circle?  
radius =

$(x^2 - 10x + 25) + (y^2 + 8y + 16) = -16 + 25 + 16$   
 $= 25$   
 $r^2 = 25$   
 $r = 5$

7 Triangle  $ABC$  is reflected across the line  $y = x$ .  
Use the Triangle tool to create the triangle on the coordinate grid.



2022 Review Exam Q3 Part 2

A right triangle ABC is shown.

1



$$\cos A = \frac{\text{Adj leg}}{\text{hyp}}$$

What is  $\cos A$ ?

$$\frac{8}{17}$$

2

Line  $k$  has a slope of  $-5$ . Line  $j$  is perpendicular to line  $k$  and passes through the point  $(5, 9)$ .

Create the equation for line  $j$ .

Point	Slope	point-slope form
$(5, 9)$	$m = -5$ $\perp m = \frac{1}{5}$	$y - y_1 = m(x - x_1)$ $y - 9 = \frac{1}{5}(x - 5)$

A triangle is shown.

3



Method 1:  $30-60-90$   
 $\therefore a = 22$

Method 2:  $\sin(30) = \frac{a}{44}$

$$44 \sin(30) = a$$

$$22 = a$$

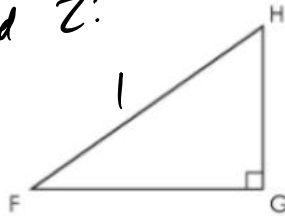
What is the length, in inches (in.), of side  $a$ ?

4 Which terms is defined as two intersecting lines that form four right angles?

- (A) skew lines *non-coplanar → don't touch*  
 (B) straight lines *ALL LINES ARE STRAIGHT*  
 (C) parallel lines *coplanar → don't touch*  
 (D) perpendicular lines

Right triangle FHG is shown.

Method 2:



$$\sin(F) = .53 = \frac{.53}{1}$$

$$\therefore \cos(F) = \frac{.53}{1} = .53$$

5

The sine of  $\angle F$  is 0.53.

What is the cosine of  $\angle H$ ? Round your answer to the nearest hundredth as needed.

Method 1:  $\angle F$  and  $\angle H$  are complements  
 $\therefore \sin(F) = \cos(H) = .53$

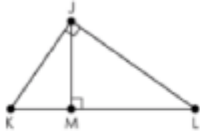
6

Triangle MNO is transformed to produce triangle PQR.

Select all the transformations that would guarantee triangles MNO and PQR are congruent

- (A) a dilation, then a translation  
 (B) a reflection, then a dilation  
 (C) a reflection, then a rotation  
 (D) a rotation, then a translation  
 (E) a translation, then a reflection

7 Mark is proving the Pythagorean Theorem. He draws right triangle JKL with altitude  $\overline{JM}$ . First he proves  $\triangle JKL \sim \triangle MKJ$  and  $\triangle JKL \sim \triangle MJL$  using the Angle - Angle criterion. The rest of his proof is shown with some steps missing.



Statements	Reasons
1. $\triangle JKL \sim \triangle MKJ$ and $\triangle JKL \sim \triangle MJL$	1. Angle - Angle Criterion
2. $\frac{JK}{LK} = \frac{MK}{JK}$ and $\frac{LJ}{LK} = \frac{ML}{LJ}$	2. Corresponding sides of similar triangles are proportional
3. $(JK)^2 = LK \cdot MK$ and $(LJ)^2 = LK \cdot ML$	3. Multiplication property of equality
4.	4.
5.	5.
6. $MK + ML = LK$	6. Segment Addition Postulate
7. $(JK)^2 + (LJ)^2 = (LK)^2$	7. Substitution



(A)

4. $(JK)^2 + (LJ)^2 = LK \cdot MK + LK \cdot ML$ ✓	4. Addition property of equality
5. $(JK)^2 + (LJ)^2 = LK(MK + ML)$ ✓	5. Distributive property

(B)

4. $(JK)^2 + (LJ)^2 = LK \cdot MK + LK \cdot ML$ ✓	4. Addition property of equality
5. $(JK)^2 + (LJ)^2 = LK(LK + LK)$ ✗	5. Distributive property

$LK(LK + LK) \neq LK \cdot MK + LK \cdot ML$

(C)

4. $(JK)^2 \cdot (JK)^2 = LK \cdot MK \cdot LK \cdot ML$ ✓	4. Multiplication property of equality
5. $(JK)^2 \cdot (LJ)^2 = LK(MK \cdot ML)$ ✗	5. Distributive property

$LK(MK \cdot ML) \neq LK \cdot MK \cdot LK \cdot ML$

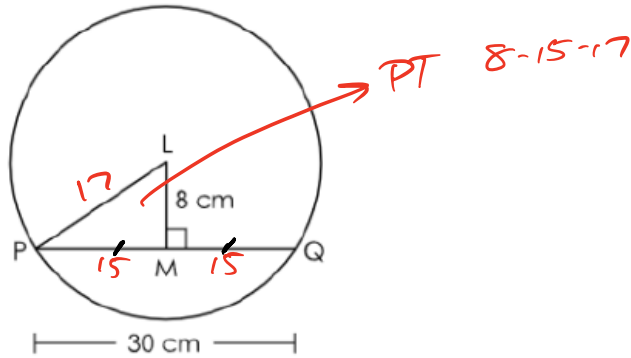
(D)

4. $(JK)^2 \cdot (JK)^2 = LK \cdot MK \cdot LK \cdot ML$ ✓	4. Multiplication property of equality
5. $(JK)^2 \cdot (LJ)^2 = LK(LK \cdot LK)$ ✗	5. Distributive property

$LK(LK \cdot LK) \neq LK \cdot MK \cdot LK \cdot ML$

**2022 Review Exam Q3 Part 3**

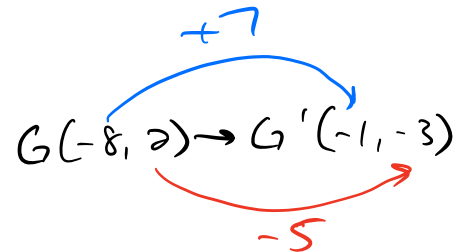
**1** In the figure shown,  $L$  is the center of the circle and  $\overline{PQ}$  is a chord of the circle measuring 30 centimeters (cm).



What is the length, in centimeters of  $\overline{PL}$ ? **17**

**2** A sequence of translations maps a  $GHI$  to  $\triangle G'H'I'$ .

- $\triangle GHI$  has vertices at  $G(-8, 2)$ ,  $H(13, 2)$ , and  $I(-2, 10)$ .
- The coordinates of  $G'$  are  $(-1, -3)$ .



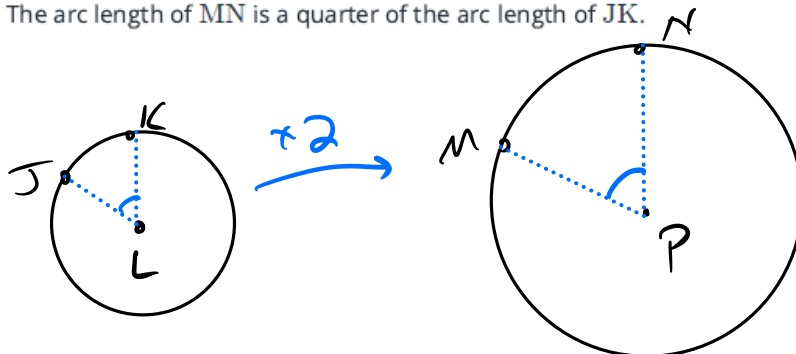
What are the coordinates for  $H'$  and  $I'$ ?

$H'$ (  ,  )  
 $I'$ (  ,  )

**3** A circle with center  $L$  contains points  $J$  and  $K$ . Circle  $L$  is dilated by a factor of 2, resulting in a new circle with center  $P$ . Points  $M$  and  $N$  are on circle  $P$  such that central angle  $MPN$  has the same measure as central angle  $JKL$ .

Which statement correctly identifies the relationship between the arc length of  $JK$  and the arc length of  $MN$ ?

- (A) The arc length of  $JK$  is half the arc length of  $MN$ .
- (B) The arc length of  $MN$  is half the arc length of  $JK$ .
- (C) The arc length of  $JK$  is a quarter of the arc length of  $MN$ .
- (D) The arc length of  $MN$  is a quarter of the arc length of  $JK$ .

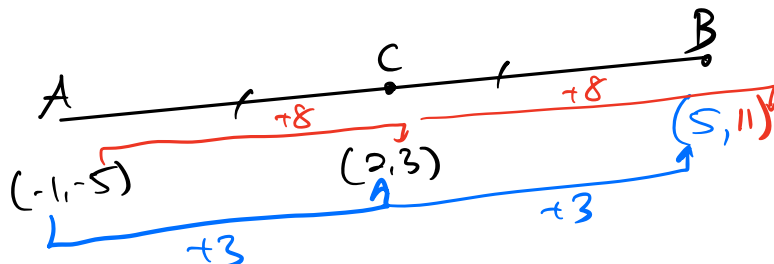


4

Point  $A$  is located at  $(-1, -5)$ . The midpoint of line segment  $AB$  is point  $C(2, 3)$ .

What are the coordinates of point  $B$ ?

(  ,  )



5

In triangle  $ABC$ ,  $\angle A$  and  $\angle B$  are complementary, where  $\cos A = 0.5$ .

What is the measure, in degrees, of  $\angle B$ ?

degrees

$$\cos A = 0.5$$

$$A = \cos^{-1}(0.5)$$

$$A = 60^\circ$$

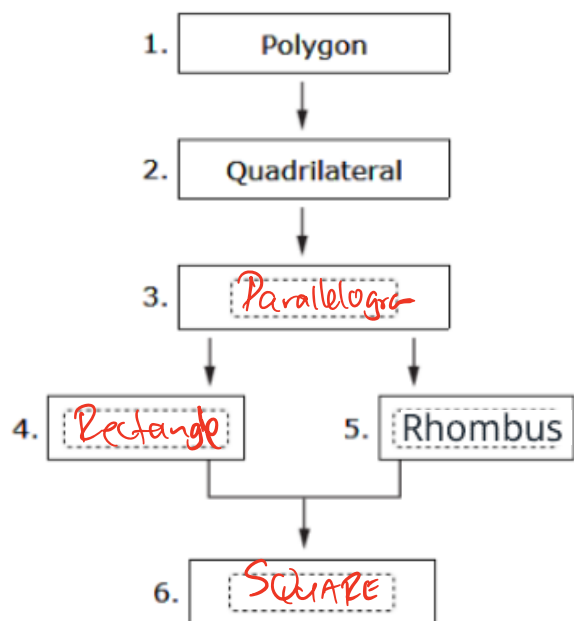
$$m\angle A + m\angle B = 90$$

$$60 + m\angle B = 90$$

$$m\angle B = 30$$



**6** A partially completed chart shows the hierarchy of a set of polygons.



Move a term to each blank box to complete the chart.

DRAG & DROP THE ANSWER

- Kite
- Square
- Parallelogram
- Rectangle