Pear Assessment

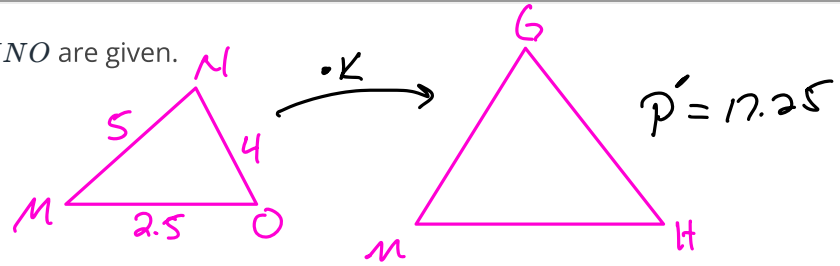
Geometry 2017-2024 STR

Created By Sean

1 The side lengths, in units, of triangle MNO are given.

- $MN = 5$
- $NO = 4$
- $OM = 2.5$

$P = 5+4+2.5 = 11.5$



Triangle MNO is dilated by a scale factor of k, with the center at point M, to create triangle MGH. Triangle MGH has a perimeter of 17.25 units.

What Is the value of k?

$k =$ $\frac{17.25}{11.5}$ or $3/2$ or 1.5

$K = \frac{P'}{P} = \frac{17.25}{11.5}$

2 The equation of a line is shown.

$6x - 3y = 5$

$6x - 5 = 3y$

A dilation centered at the origin with a scale factor of 6 is applied to this line.

$\frac{6}{3}x - \frac{5}{3} = y$

A. What is the slope of the line after the dilation?
B. What is the value of the y-intercept of the line after the dilation?

$2x - \frac{5}{3} = y$

slope $= 2$ y-int $= -5/3$

A. 2

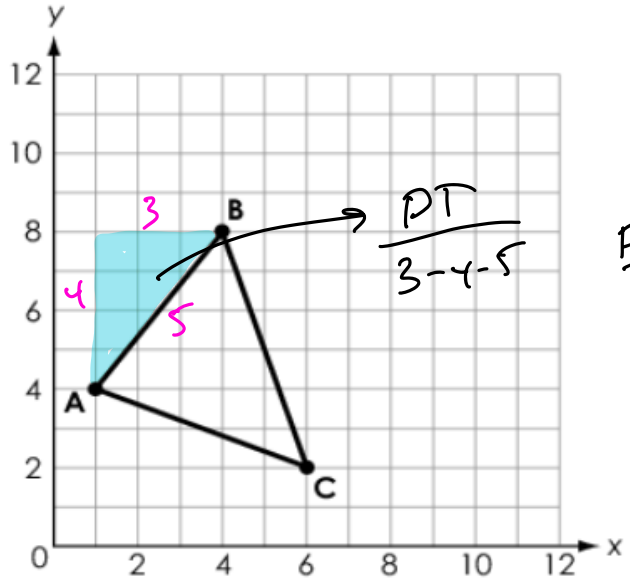
B. -10

Dilate by 6 $m = 2$ y-int $= \frac{-5}{3}(6) = -10$

Dilating changes y-int

Dilating DOES NOT change slope

3 Triangle ABC is shown.



PT 3-4-5

FIND $AB = 5$

FIND $A'B' = AB \cdot K$

$= 5 \cdot 4$

$A'B' = 20$

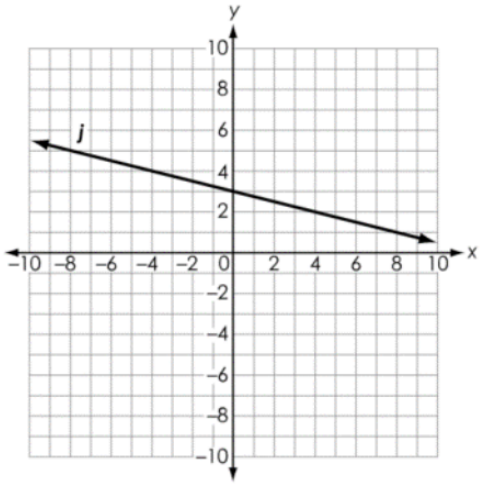
Triangle $A'B'C'$ is created by dilating triangle 4.

What is the length of ~~$\overline{A''B''}$~~? Typo. $\overline{A'B'}$

20

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4 Nasir graphs line j on the coordinate plane as shown.



This means j and K are same line

Same Slope

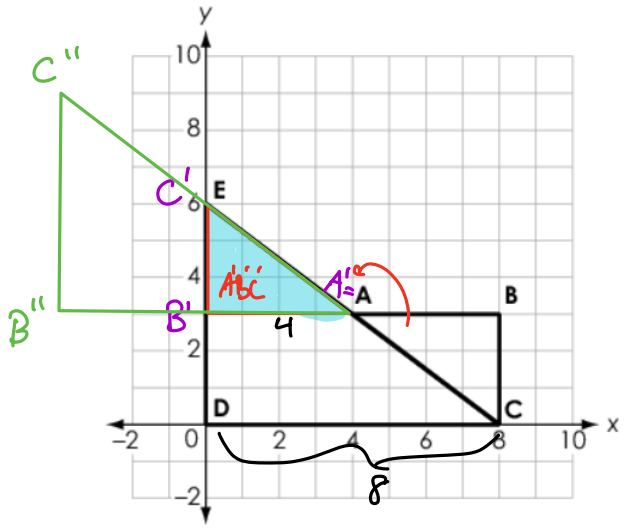
He dilates j by a scale factor of 3 about point P to create line k. Line j and line k coincide.

What is a possible ordered pair for point P?

(0 , 3)

Choose Any point on line j.

5 Two triangles are shown on a coordinate grid.



Katie shows that the two triangles are similar by performing the following transformations:

- First, she rotates $\triangle ABC$ 180° about point A.
- Then, she dilates $\triangle A'B'C'$ by a factor of k with a center of dilation at point A.
- Finally, she translates $\triangle A''B''C''$ p units to the right and q units down to map onto $\triangle CDE$.

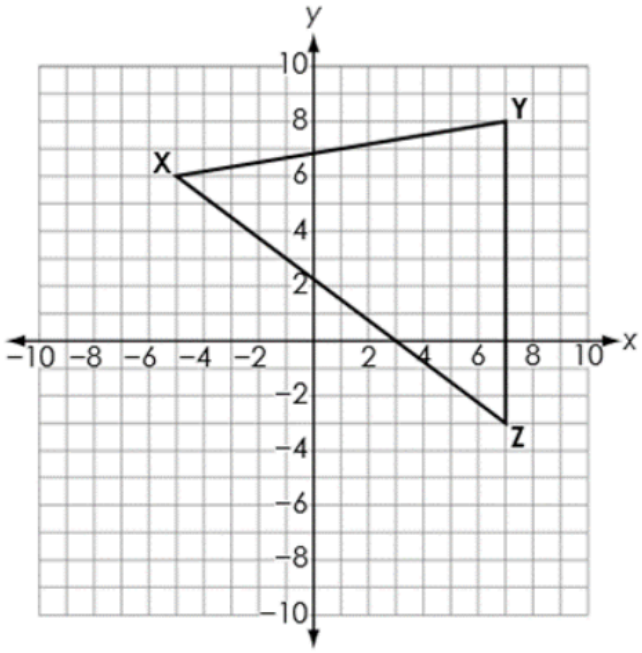
What are the values of k, p and q?

$k =$ 2

$p =$ 4

$q =$ 3

6 Triangle XYZ is shown.



Which transformation on $\triangle XYZ$ results in a triangle that is similar, but not congruent, to $\triangle XYZ$?

Dilate

(A) a translation 3 units to the right

(B) a reflection across the line $y = -2x + 3$

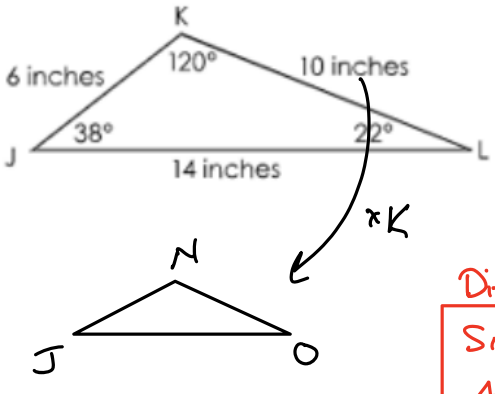
(C) a rotation 90° clockwise around the origin

a dilation centered at the origin with a scale factor of 2

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7 Megan dilates $\triangle JKL$ about point J by a scale factor of $\frac{3}{5}$ to create $\triangle JNO$.

(a)



$10 \cdot K = NO$

$10 \cdot \left(\frac{3}{5}\right) = 6$

What is the length, in inches, of $\overline{NO}$?

$NO =$ 6 inches

Dilation

SIDES Change

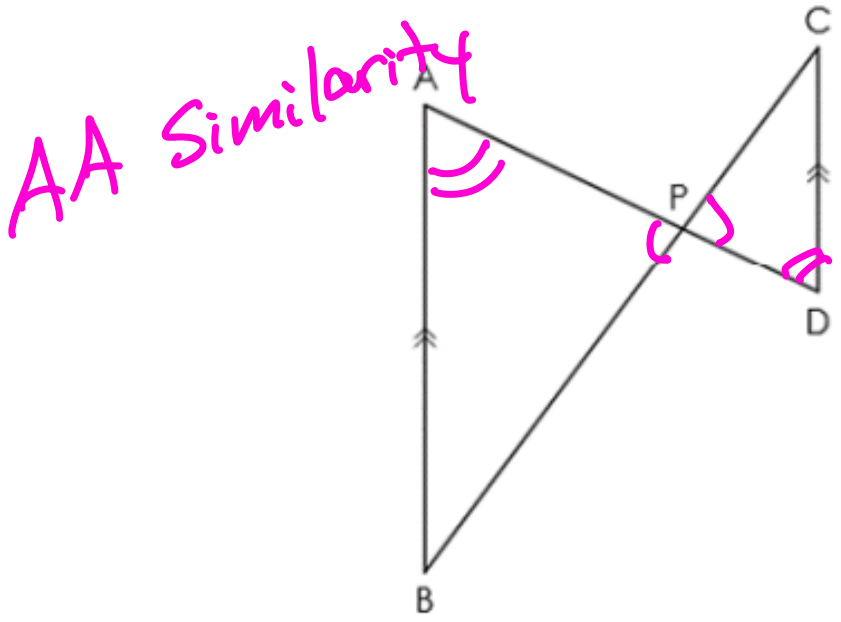
Angles Don't

(b) What is the measure, in degrees, of $\angle O$?

22 degrees

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8 A figure is shown, where $\overline{AB} \parallel \overline{CD}$.



Complete the statement to describe the relationship between the two triangles.

Triangle APB is **a** to triangle DPC because triangle APB is a **b** of triangle DPC.

a

- [x] similar Similar
- [ ] not similar

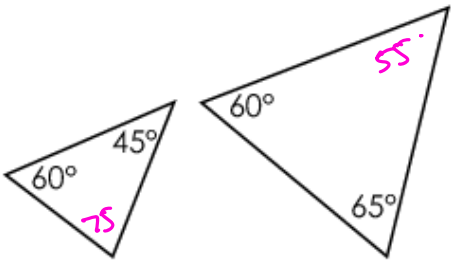
b

- [x] rotation and a dilation
- [ ] rotation and a reflection
- [ ] translation and a dilation
- [ ] reflection and a translation

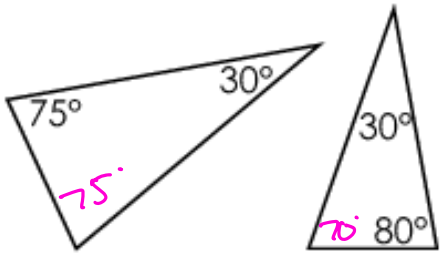
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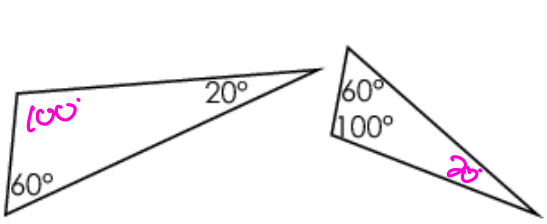
9 Which pair of triangles is similar? AA Similarity

A

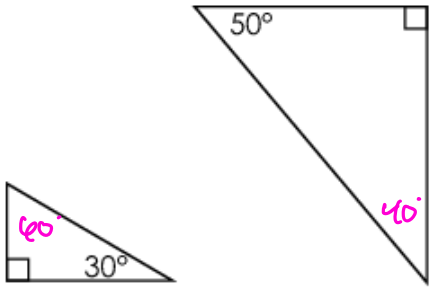


B

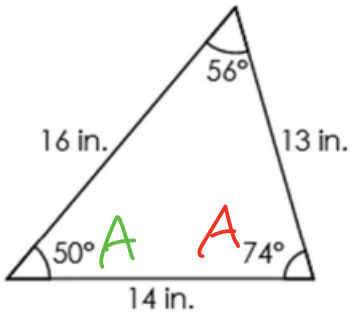




D



10 A triangle is shown.



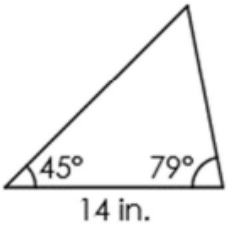
AA - Sim

Which triangle is similar?

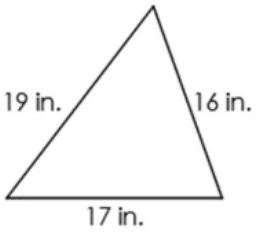
A



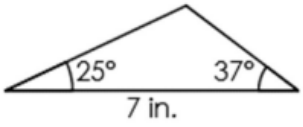
B



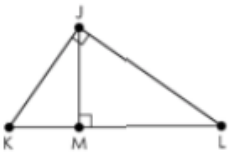
C



D



11 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

Which two steps are missing from the proof?

Adding EQ from #3

(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

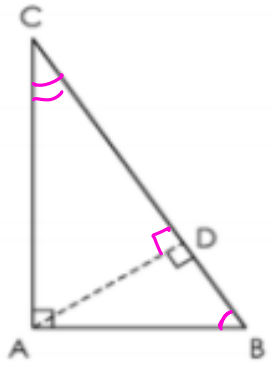
(C)

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

(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

12 James correctly proves the similarity of triangles DAC and DBA as shown.



His incomplete proof is shown.

	Statements		Reasons
1.	$m\angle CAB = m\angle ADB = 90°$	1.	Given
2.	$m\angle ADB + m\angle ADC = 180°$	2.	Angles in a linear pair are supplementary.
3.	$90° + m\angle ADC = 180°$	3.	Substitution
4.	$m\angle ADC = 90°$	4.	Subtraction property of equality
5.	$\angle CAB \cong \angle ADB$ $\angle CAB \cong \angle ADC$	5.	Definition of congruent angles
6.	$\angle ABC \cong \angle DBA$ $\angle DCA \cong \angle ACB$	6.	Reflexive property of congruence
7.	$\triangle ABC \sim \triangle DBA$ $\triangle ABC \sim \triangle DAC$	7.	?
8.	$\triangle DBA \sim \triangle DAC$	8.	Substitution

What as the missing reason for the seventh statement?

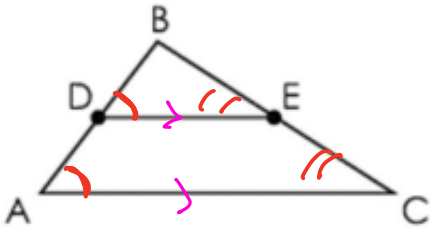
A $CPCTC$ △ not congruent

B AA postulate

C All right triangles are similar False

D Transitive property of similarity Can't be true b/c we haven't stated any similar △s previously

13 Triangle ABC and triangle DBE are shown. $\overline{DE}$ is parallel to $\overline{AC}$.



AA Sim

Marsha wants to prove that the side lengths of triangle DBE are proportional to those of triangle ABC.

An incomplete proof is given.

Statement	**Reasons**
1. $\overline{DE} \parallel \overline{AC}$	Given
2. $\angle BAC \cong \angle BDE$	Corresponding angles of parallel lines are congruent
3. $\angle BCA \cong \angle BED$	Corresponding angles of parallel lines are congruent

Which statement and reason would be the **best** next step in the proof.

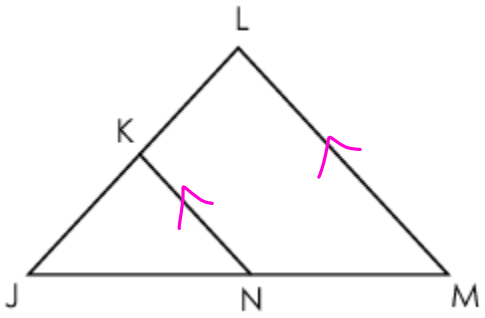
(A) $AD = DB$ because D is the midpoint of $\overline{AB}$

(B) Triangle ABC is similar to triangle DBE by AA.

(C) Triangle ABC is similar to triangle DBE by ASA.

(D) $\frac{AB}{DB} = \frac{BC}{BE}$ because corresponding sides of similar triangles are in proportion.

14 A triangle JLM and line segment KN are given.



A proof of $\frac{JK}{JL} = \frac{JN}{JM}$ is shown.

Statements	**Reasons**
$\triangle JLM$	Given
?	Given
$\angle JNK = \angle JML$ $\angle JKN = \angle JLM$	only true if parallel lines. Corresponding angles are congruent.
$\triangle JKN = \triangle JLM$	Angle-angle similar triangle postulate
$\frac{JK}{JL} = \frac{JN}{JM}$	Corresponding parts of similar triangles are proportional.

Which statement must be added to the given to keep this proof valid?

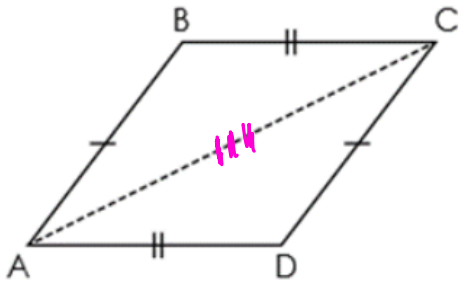
(A) $\overline{JL} \perp \overline{LM}$

(B) $\overline{KN} \perp \overline{LM}$

(C) $\overline{JL} \parallel \overline{LM}$

(D) $\overline{KN} \parallel \overline{LM}$

15 In quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{AD}$, as shown.



Select a term for each blank box to complete the proof showing that $\triangle ABC \cong \triangle CDA$.

By the **a** property of congruence, we can show that **b** . Therefore it can be established that $\triangle ABC \cong \triangle CDA$ by the **c** congruence theorem.

a

- reflexive
- symmetric
- transitive

b

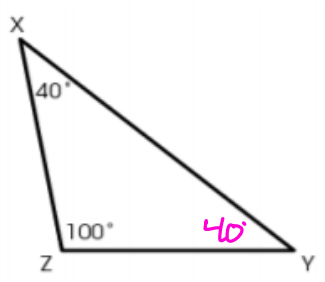
- Segment AB ≅ Segment AD
- Segment AC ≅ Segment CA
- ∠ABC ≅ ∠CDA
- ∠BAC ≅ ∠ACD

c

- ASA
- SAS
- SSS

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16 Triangle XYZ is shown.

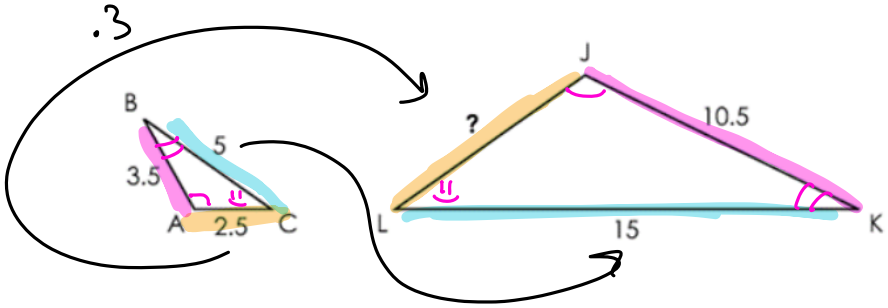


Which triangle must be similar to triangle XYZ?

- a triangle with two angles that measure $40°$
- B a triangle with angles that measure $40°$ and $60°$
- C a scalene triangle with only one angle that measures $100°$
- D an isosceles triangle with only one angle that measures $40°$

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17 Two similar triangles, $\triangle ABC$ and $\triangle JKL$ are shown.



What is the length of side JL?

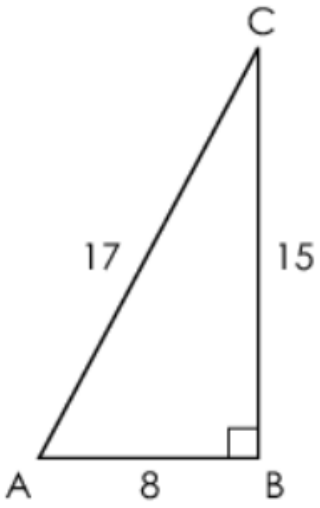
$5 \cdot k = 15$

$k = 3$

7.5

---

18 A right triangle ABC is shown.



What is cos A? = $\frac{\text{Adj Leg}}{\text{hyp}}$

$\frac{8}{17}$

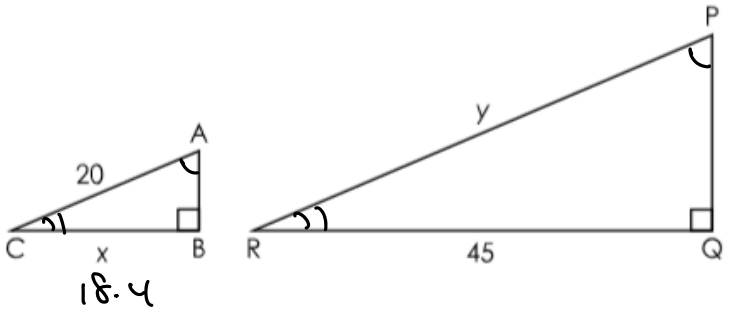
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19 A teacher asked Dwayne to find the values of x and y in the triangles shown.

$\cos(C) = \frac{x}{20}$

$.92 = \frac{x}{20}$

18.4



18.4

The teacher provided the following information about the triangles:

- Triangle ABC is similar to triangle PQR.
- In triangle ABC, $\cos(C) = 0.92$.

False

Dwayne claims that the value of x can be determined but the information provided is not sufficient to find the value of y.

Which statement about Dwayne's claim is accurate?

(A) His claim is correct because $\cos(C) = \frac{20}{x}$ and 0.92 can be substituted for $\cos(C)$, but the cosine of angle R is not given for triangle PQR

(B) His claim is correct because $cos(C) = \frac{x}{20}$ and 0.92 can be substituted for $\cos(C)$, but the cosine of angle R is not given for triangle PQR .

(C) His claim is incorrect because $cos(C) = \frac{20}{x}, 0.92$ can be substituted for $\cos(C)$, and since the triangles are similar, this ratio will be the same as $\frac{y}{45}$.

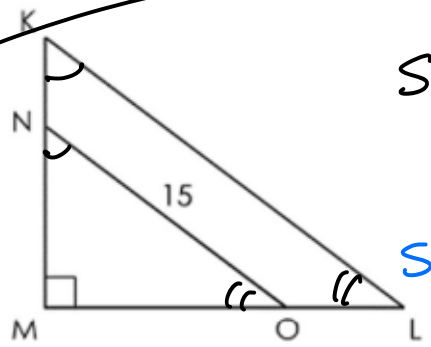
False

(D) His claim is incorrect because $cos(C) = \frac{x}{20}, 0.92$ can be substituted for $\cos(C)$, and since the triangles are similar, this ratio will be the same as $\frac{45}{y}$.

True

True

20 Triangle MKL is similar to triangle MNO and $NO = 15$, as shown.



$\sin(K) = \frac{8}{10}$

$\therefore$

$\sin(N) = \frac{8}{10} = \frac{MO}{15}$

$\frac{8(15)}{10} = MO$

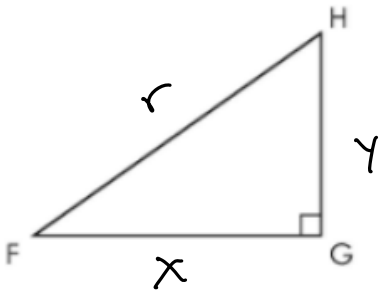
$12 = MO$

The sine of $\angle MKL$ is 0.8.

What is the length , in units, of side MO? 12 units

---

21 Right triangle FHG is shown.



complementary

$\sin F = \cos H$

The sine of $\angle F$ is 0.53.

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

.53

---

22 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) $\cos A = \sin B$

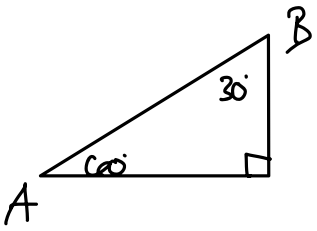
23 In triangle ABC, $\angle A$ and $\angle B$ are complementary, where $\cos A = 0.5$.

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

30 degrees

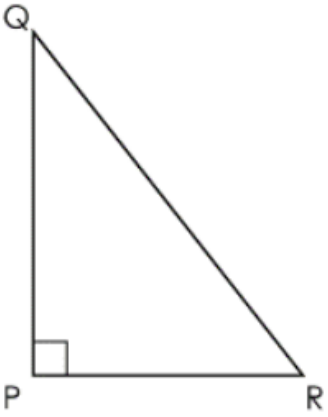
$A = \cos^{-1}\left(\frac{1}{2}\right)$

$A = 60^\circ$



---

24 Right triangle PQR is shown, where $m\angle Q$ is not equal to $m\angle R$.



Sum 90°

$\sin Q = \cos R$

Which expression is equivalent to $\sin(Q)$?

(A) $\sin(P)$

(B) $\cos(P)$

(C) $\sin(R)$

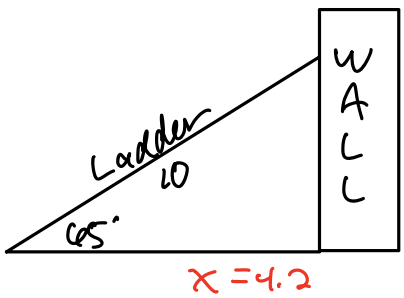
(D) $\cos(R)$

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25 Regis leans a 10-foot ladder against a wall. The base of the ladder makes a 65° angle with the ground.

(a) What Is the distance, In feet, from the base of the ladder to the base of the wall? Round to the nearest tenth of a foot.

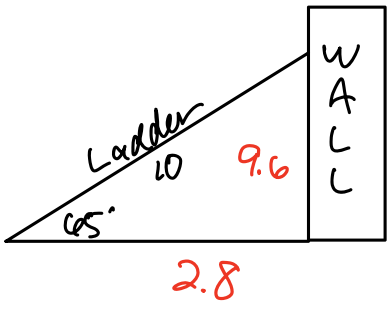
4.2 feet



$\cos 65 = \frac{x}{10}$

$10 \cos 65 = x$

4.2



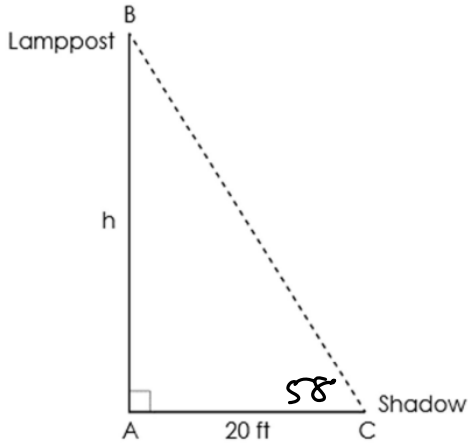
(b) Regis needs to move the ladder so that It reaches a window 9.6 feet above the ground.

How many feet **closer** to the building does he need to move the base of the ladder?

$4.2 - 2.8 = 1.4$

---

26 A lamppost casts a shadow of 20 feet (ft) along the ground, as shown.



$\tan(58^\circ) = \frac{h}{20}$

$20\tan(58^\circ) = h$

$32 \approx h$

The measure of angle C is 58 degrees.

What is the height, h, of the lamppost to the nearest foot?

32 *feet*

---

27 A triangle is shown.



$30-60-90$

$x - x\sqrt{3} - 2x$

or $\sin 30 = \frac{a}{44}$

$44 \sin 30 = a$

$22 = a$

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

22 *in.*

---

28 Kevin is creating a mosaic out of tiles. One of the tiles is shown.

① $\cos(35°) = \frac{x}{12}$

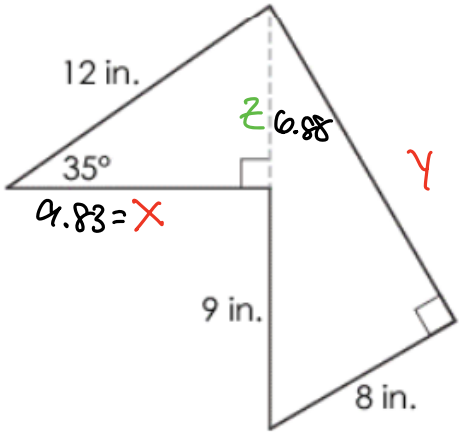
$12\cos(35°) = x$

$9.83 = x$

② $\sin(35°) = \frac{z}{12}$

$12\sin(35°) = z$

$6.88 = z$



③ $8^2 + y^2 = 15.88^2$

$y = \sqrt{15.88^2 - 8^2}$

$y = 13.72$

$P = 12 + 9 + 8 + x + y$

9.83 (x) 13.72 (y)

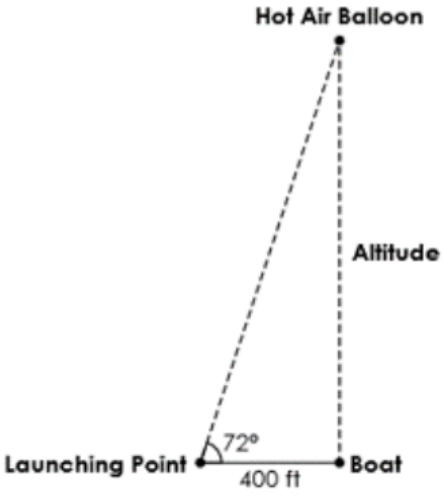
What is the perimeter of the tile, rounded to the nearest inch (in.)?

53 *in.*

29 A hot air balloon is launched and drifts over a boat.

- The balloon's altitude increases at a constant rate.
- The balloon is directly above a boat 400 feet (ft) away from the launching point 5 minutes after it is launched.
- The angle of elevation is 72°.

A figure describing the situation is shown.



What is the change in the altitude, in feet, of the hot air balloon each minute? Round your answer to the nearest foot.

246 *feet*

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① At 0 minutes the balloon's height is 0 feet

② At 5 minutes, the balloon's height is 1231.07 feet

③ $\tan 72^\circ = \frac{\text{height}}{400}$

$400 \tan(72^\circ) = \text{height}$

$1231.07 \approx h$

④ $\frac{1231.07 \text{ feet}}{5 \text{ min}} = \frac{246 \text{ ft}}{1 \text{ min}}$