## Day 73

### 1. Opener

a) A 25 foot ladder leans against a wall. It touches the wall 24 feet off the ground. If you slide the base of the ladder back 10 feet on the ground, how far does it slide down the wall?

b) A pyramid has a base apothem of 8 ft. and a base side length of 12 ft. The triangles that make up its side each have height 40 ft. It's total surface area is 7200 sq ft. How many edges does the pyramid have?

c) What do you call someone from: Louisiana, Maine, Connecticut, New Jersey, Massachusetts

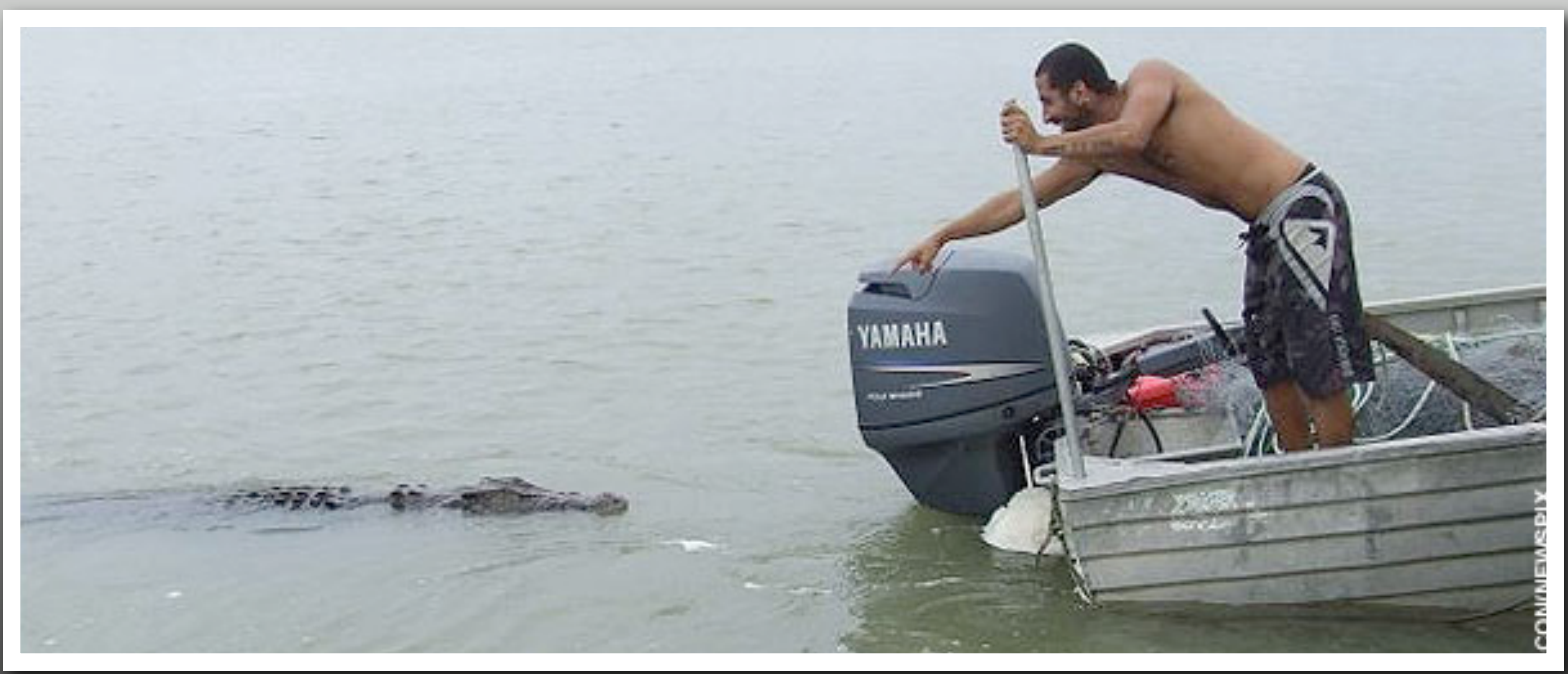
Louisianans, Mainers, Nutmeggers, New Jersey-ites, Bay Staters (Massholes, more locally).

ICON IMAGES/NEWSPIX

http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2008/03/05/wcroc105.xml

YAMAHA
CON/NEWSPIX

http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2008/03/05/wcroc105.xml



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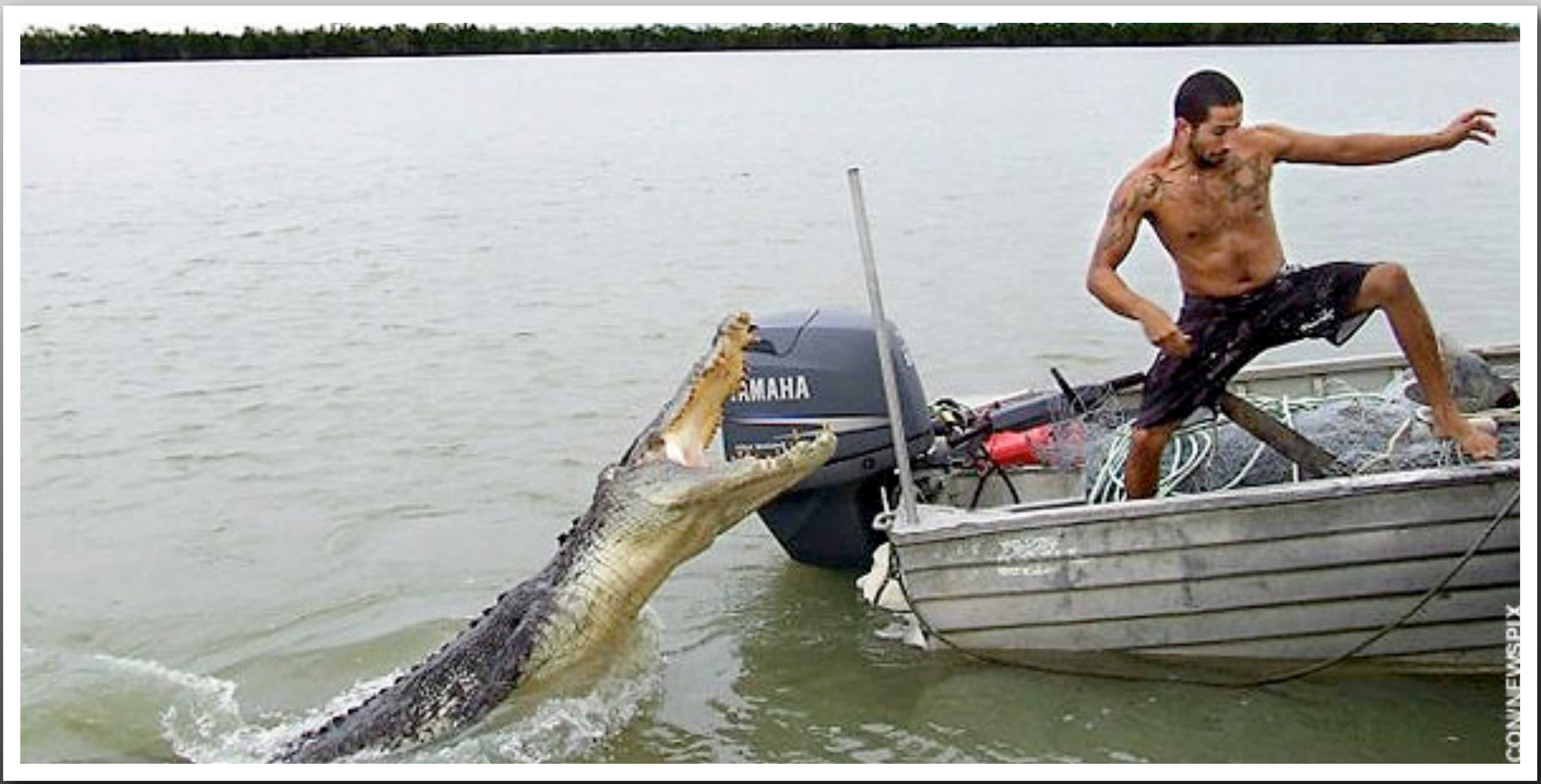
http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2008/03/05/wcroc105.xml


YAMAHA
CONNEWSPIX

http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2008/03/05/wcroc105.xml

**CST Toolkit**

## Released Question #43

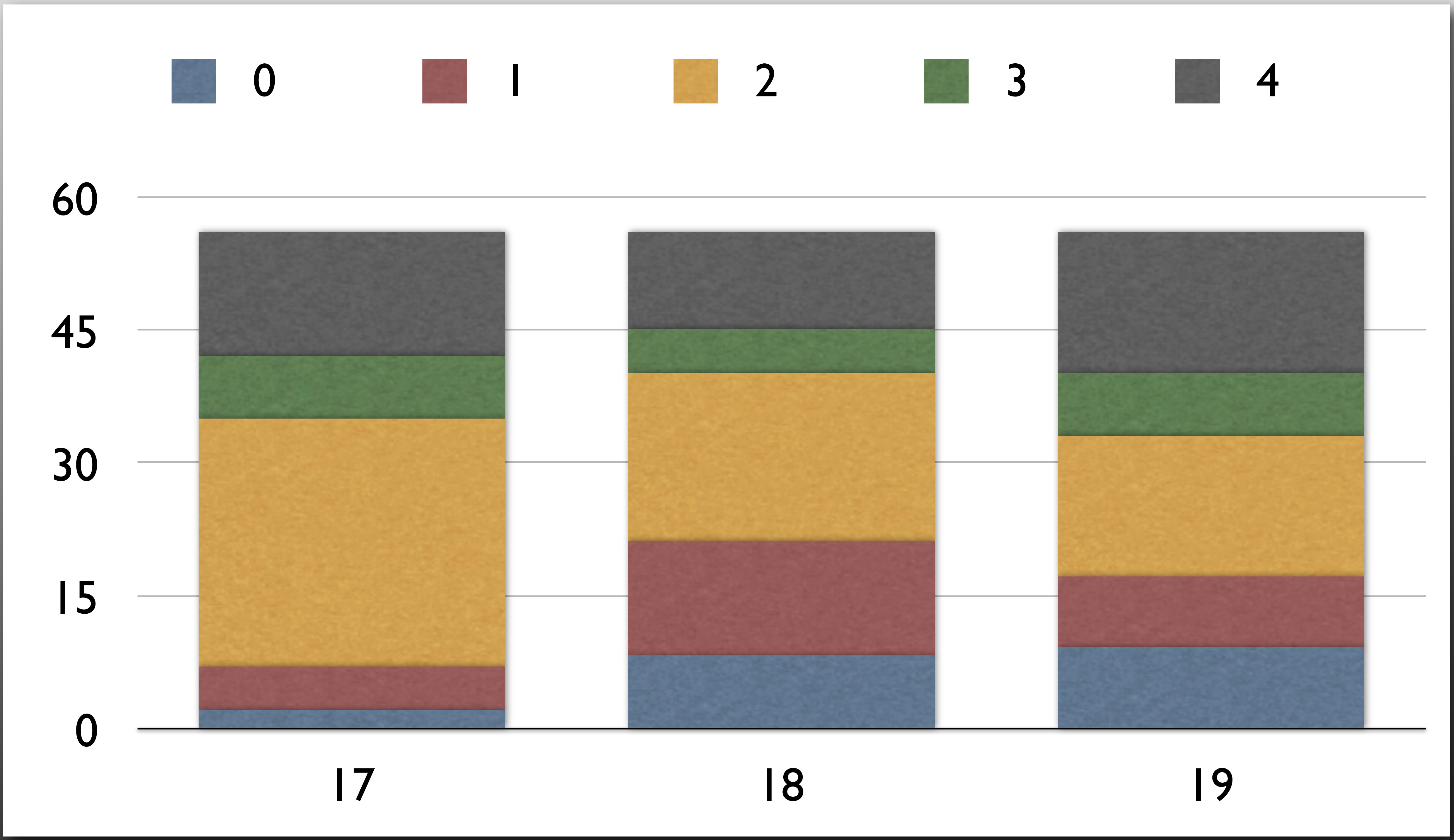
The sum of the interior angles of a polygon is the same as the sum of its exterior angles. What type of polygon is it?

**A.** quadrilateral

**B.** hexagon

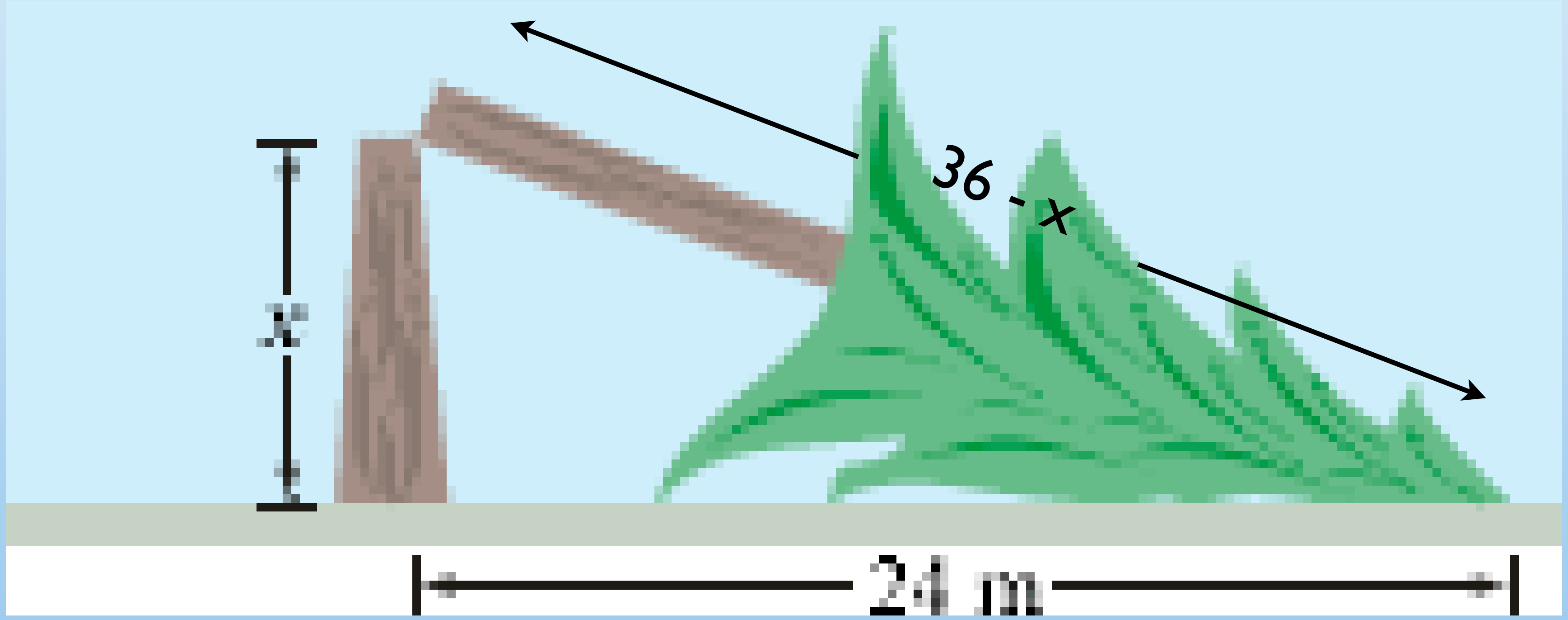
**C.** octagon

**D.** decagon


0
1
2
3
4
60
45
30
15
0
17
18
19

## 2. Pythagorean Word Problems

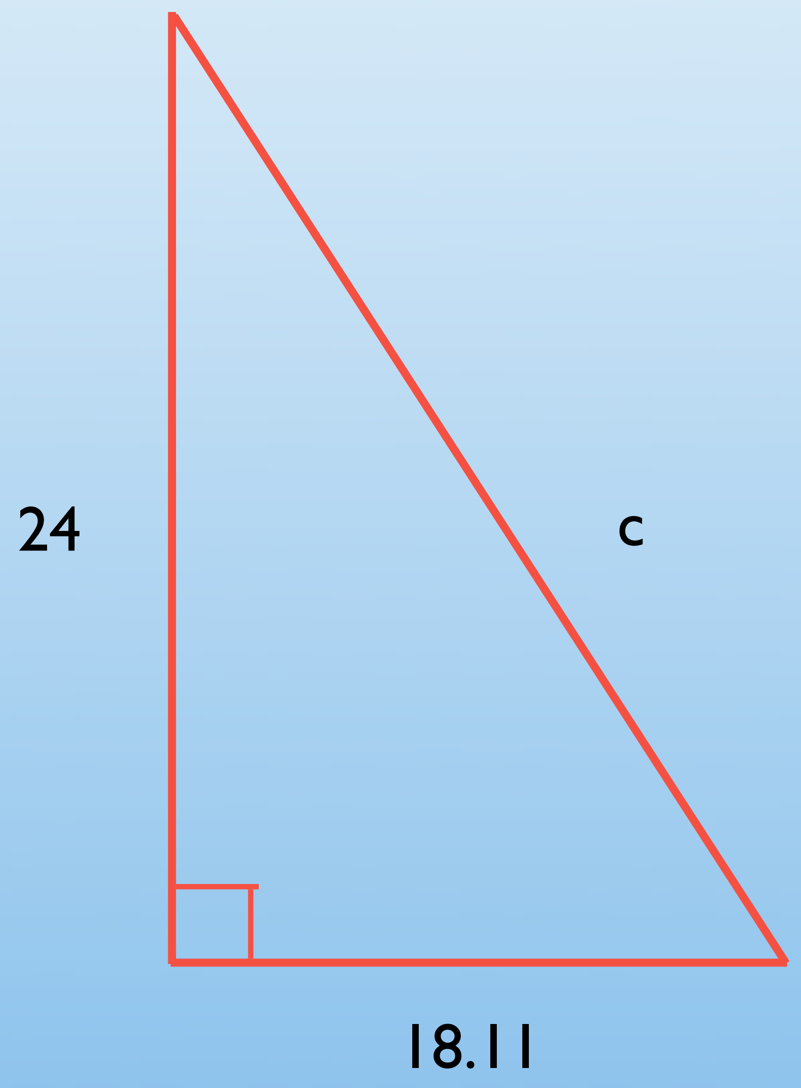
pg. 482 // #1, 2, 4 - 6

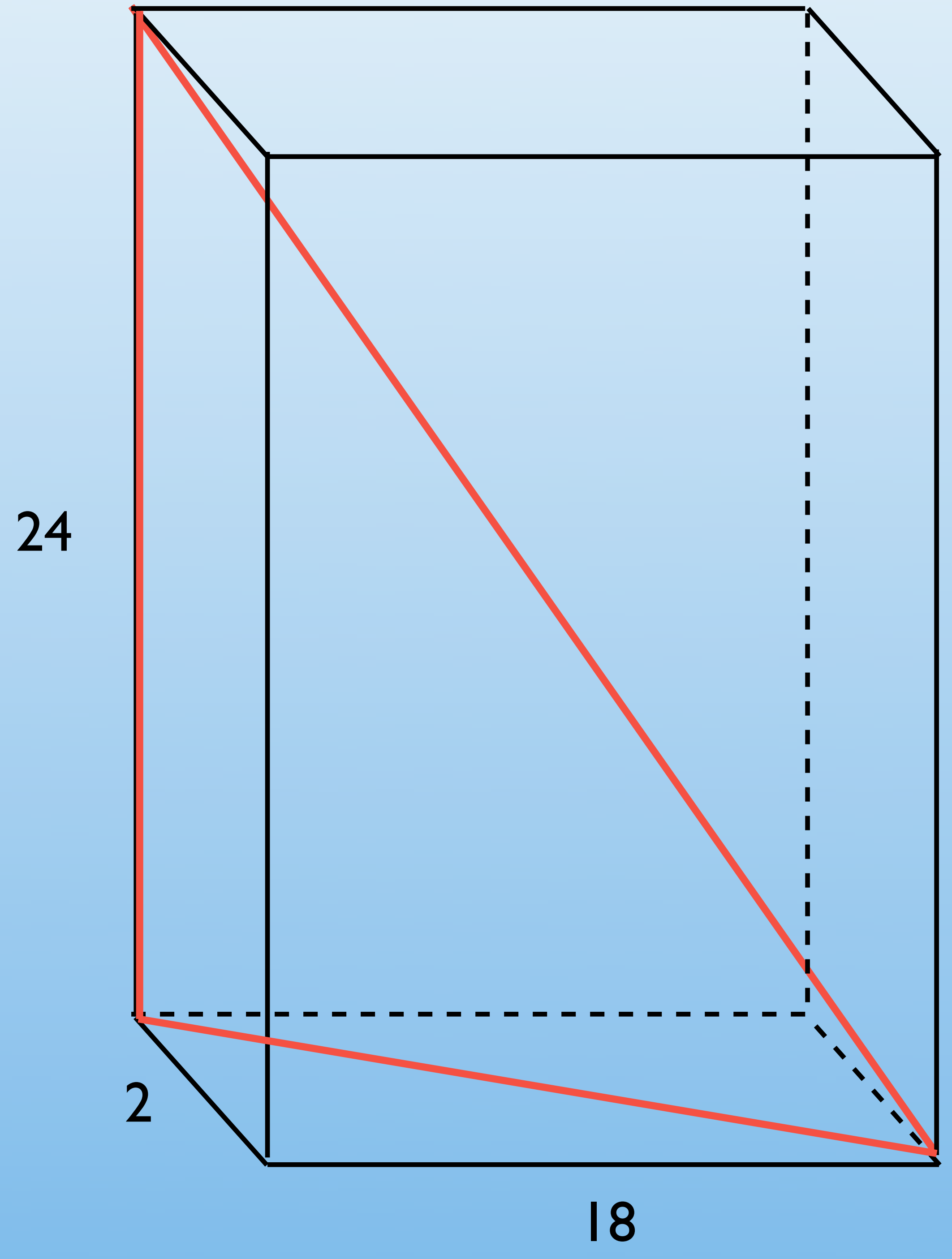


I cut the word problem assignment waaay back.  Painful.

# 2. Pythagorean Word Problems

pg. 482 // #1, 2, 4 - 6

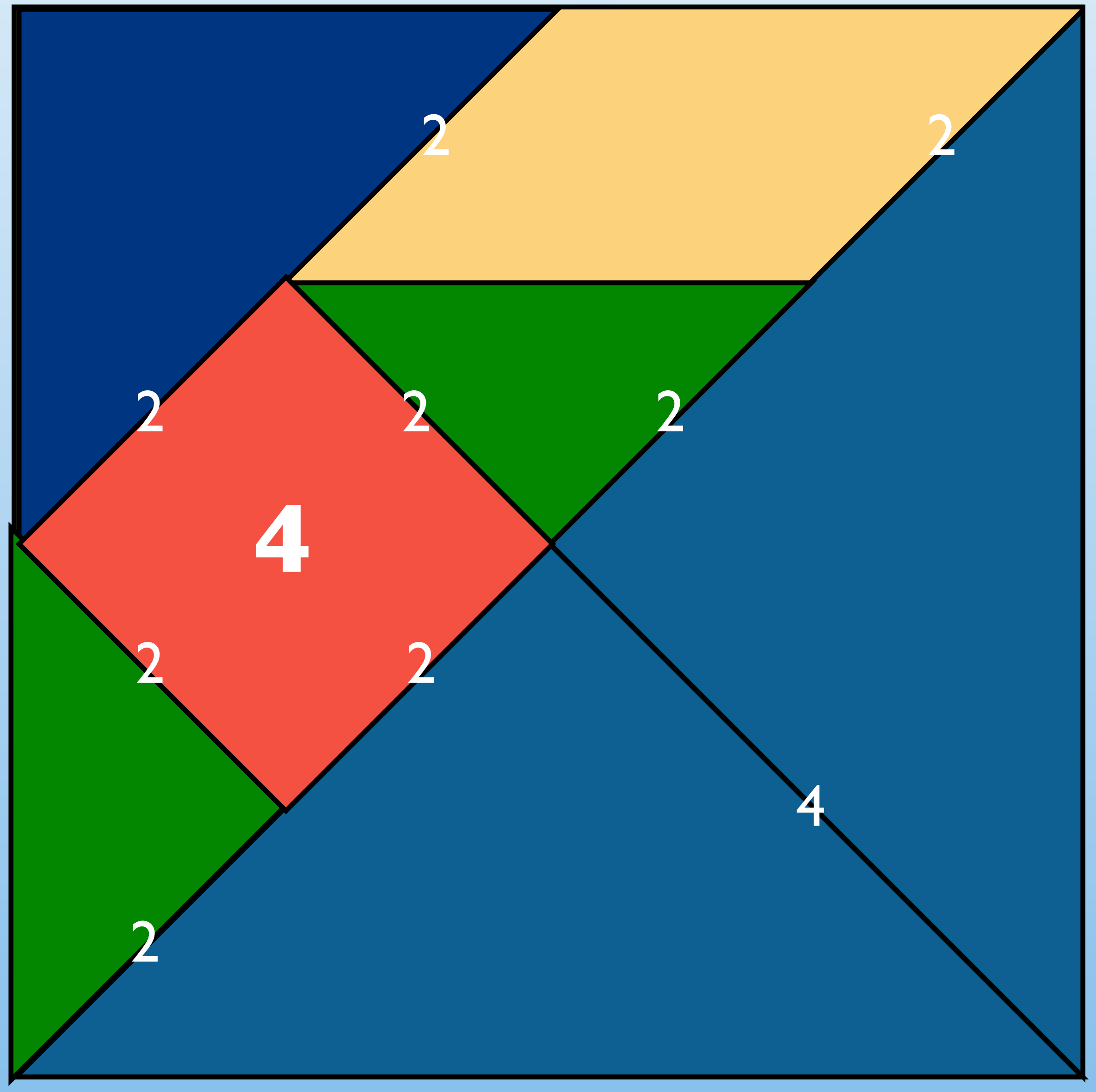




Ask if the baseball bat (34 in.) fits in vertically.  Where’s the right triangle?

## 2. Pythagorean Word Problems

pg. 482 // #1, 2, 4 - 6

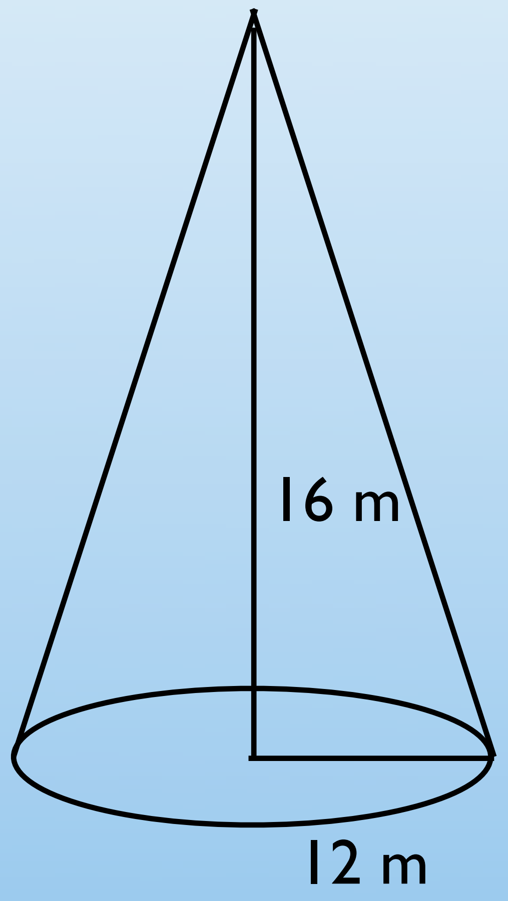

2
2
2
2
2
4
2
2
4
2

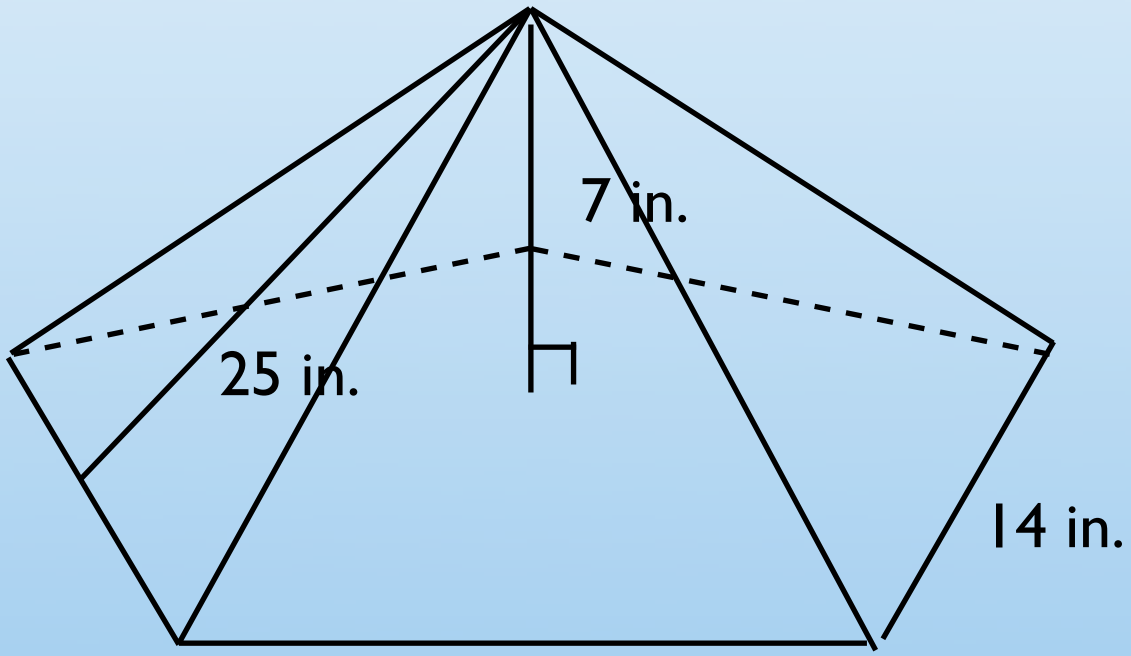
Didn’t get to this.

## Day 74

### 1. Opener

a-b) Find the surface area.



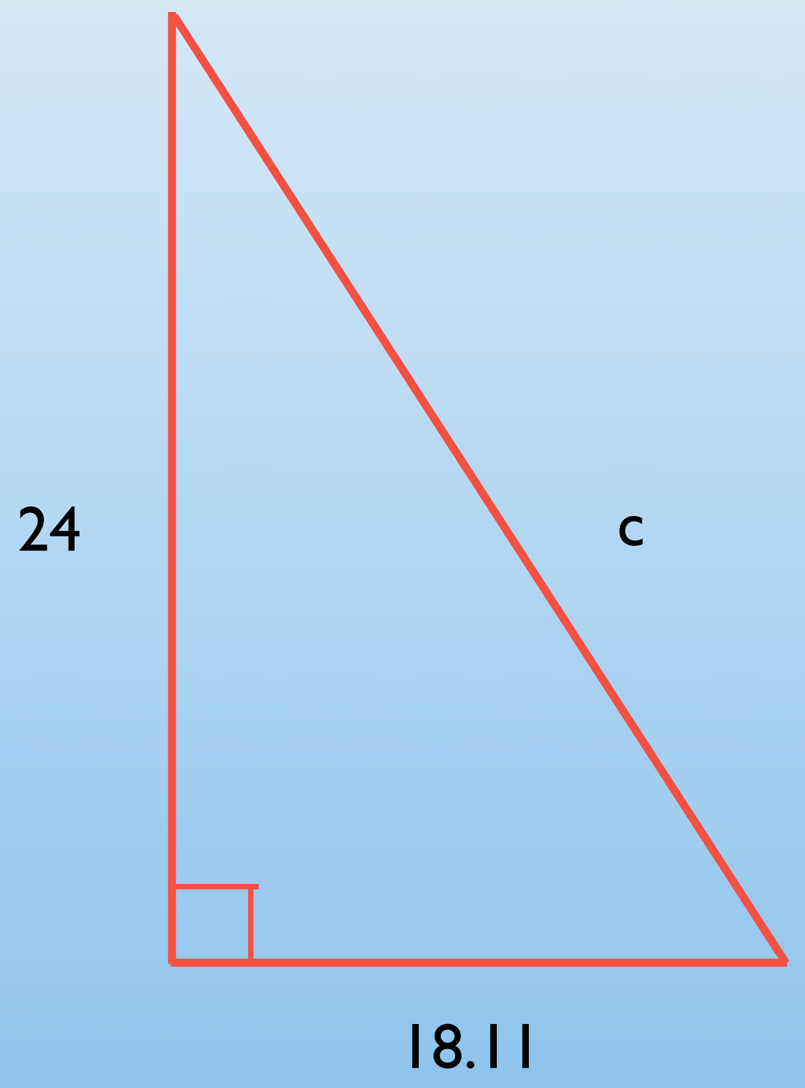


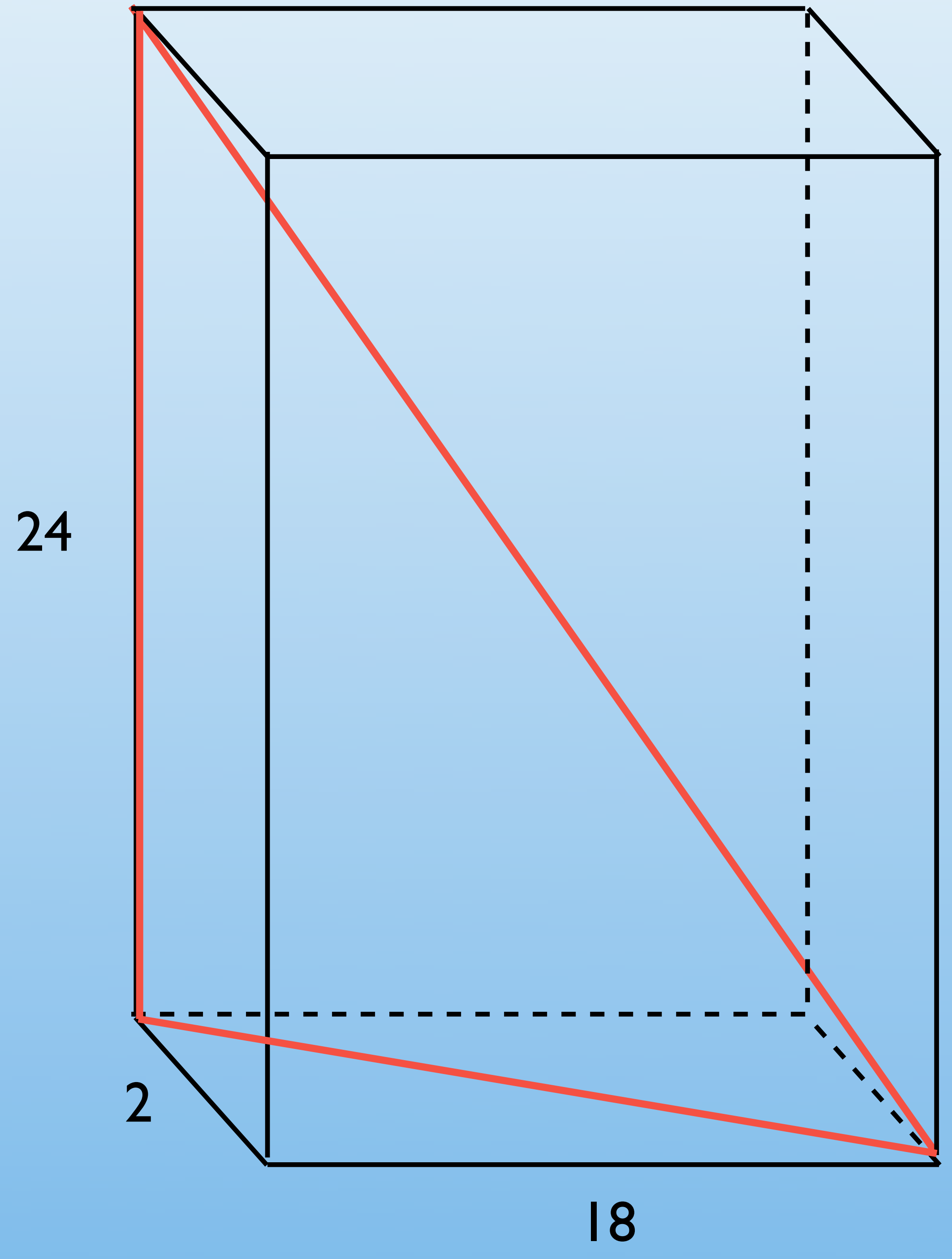
c) What kind of insurance do 4,000,000 Japanese golfers carry?

Hole-in-one insurance. Sunday Times. Because if you nail a hole-in-one you are obliged to buy drinks, meals, and gifts for the entire clubhouse.

# 2. Pythagorean Word Problems

pg. 482 // #1, 2, 4 - 6



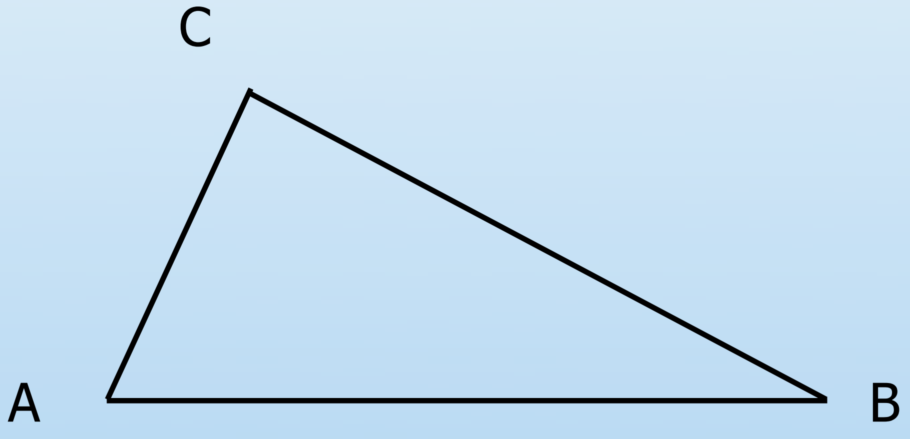


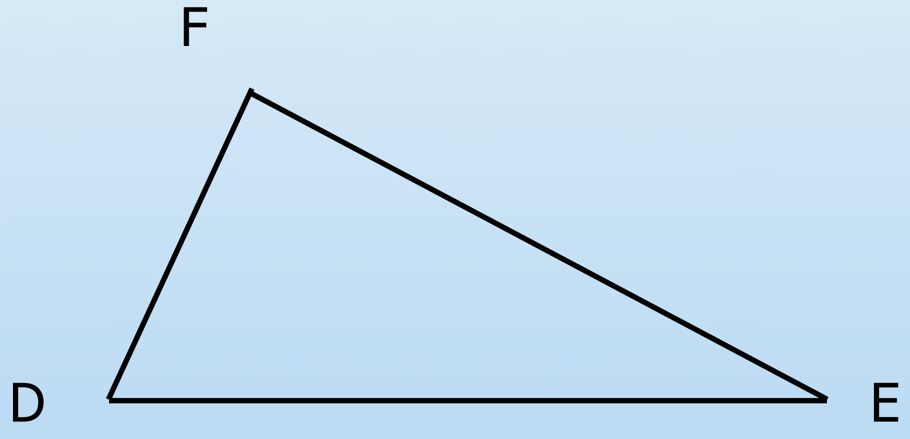
Ask if the baseball bat (34 in.) fits in vertically.  Where’s the right triangle?

CST Toolkit

## Released Question #19

In the figure below, $\overline{AC} \cong \overline{DF}$ and $\angle A \cong \angle D$.





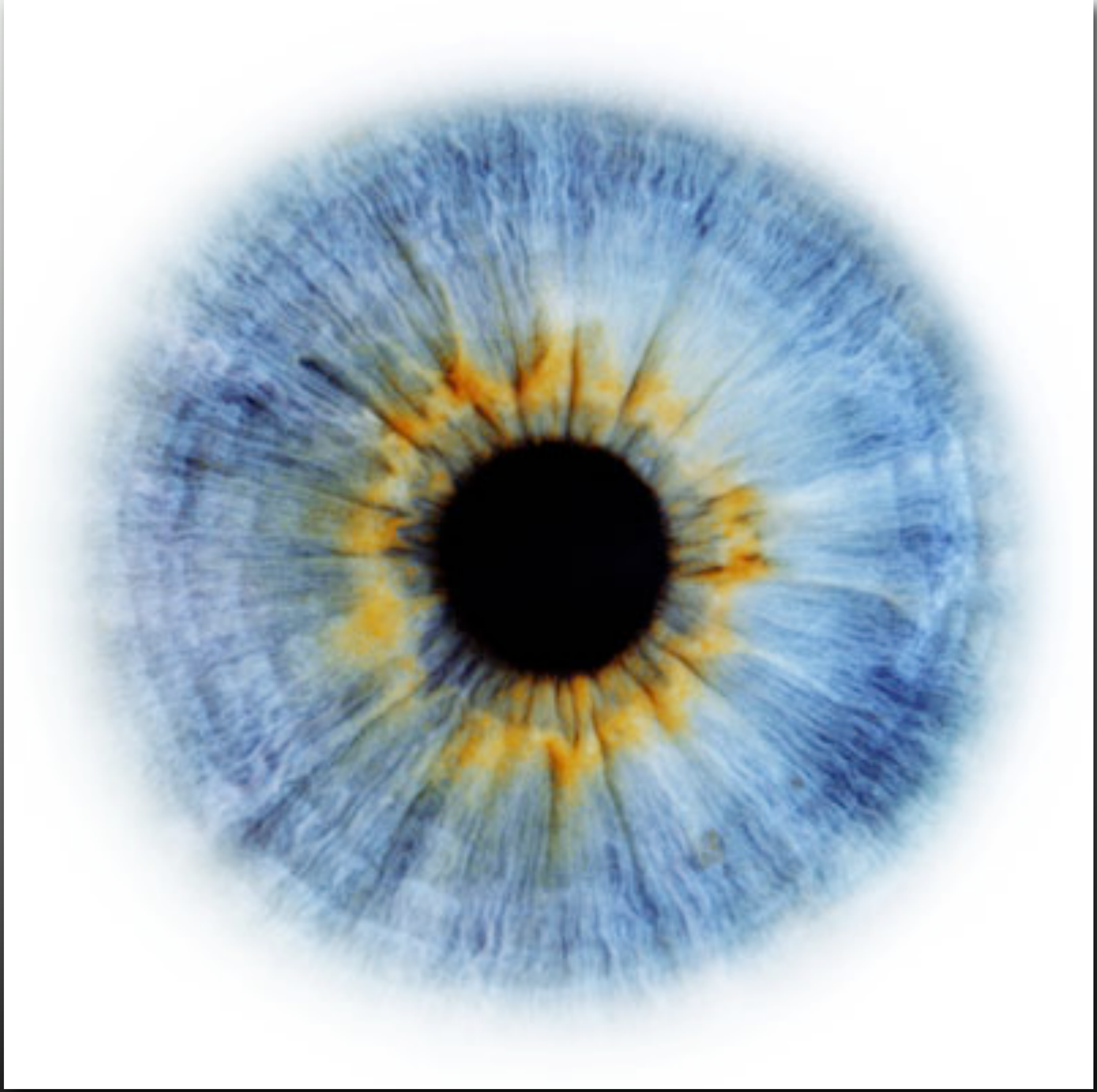
Which additional information would be enough to prove that $\triangle ABC \cong \triangle DEF$.

**A.** $\overline{AB} \cong \overline{DE}$

**B.** $\overline{AB} \cong \overline{BC}$

**C.** $\overline{BC} \cong \overline{EF}$

**D.** $\overline{BC} \cong \overline{DE}$



http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

Homeboy took photos of his family and friends’ eyes.

http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

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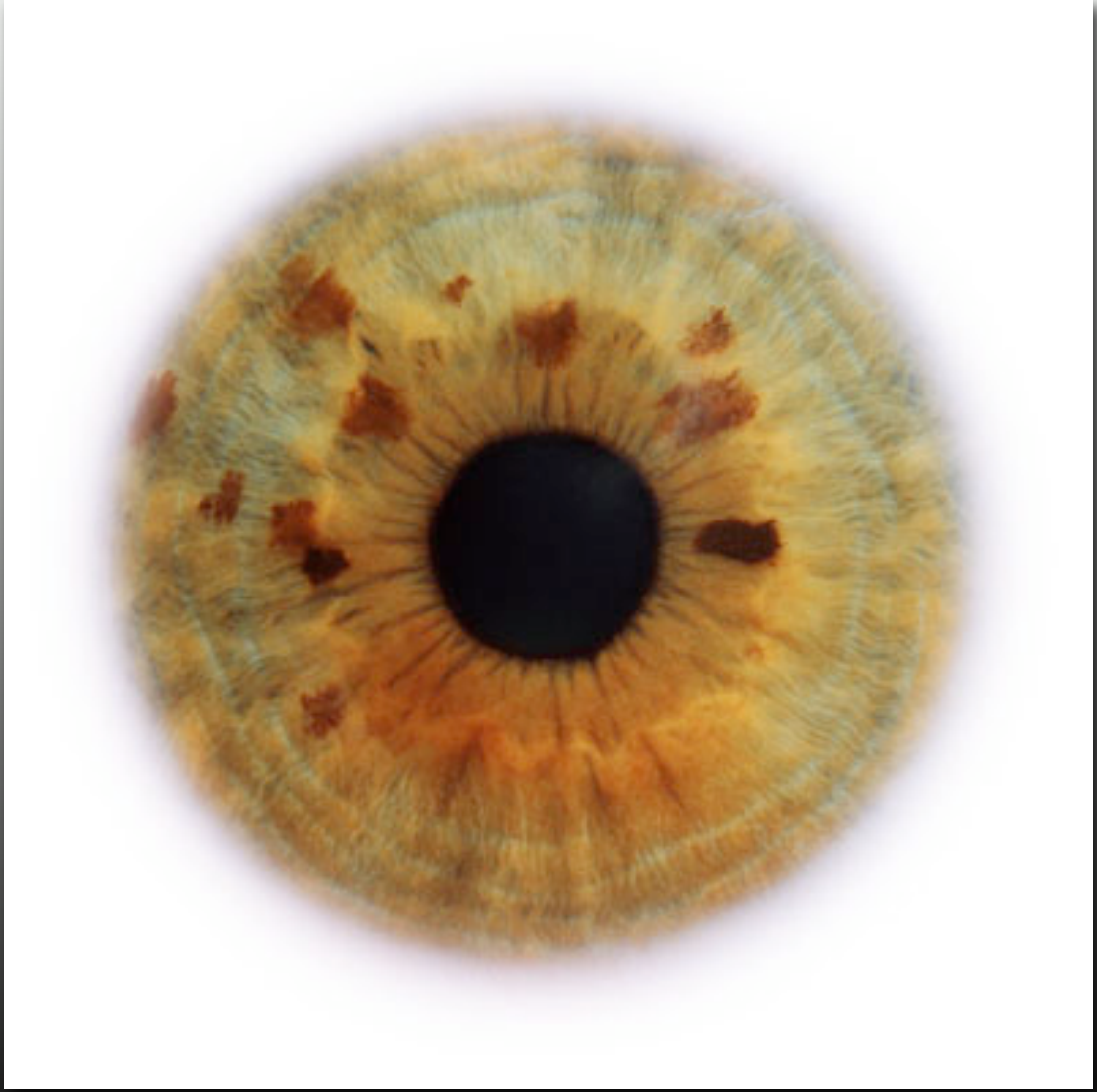

http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

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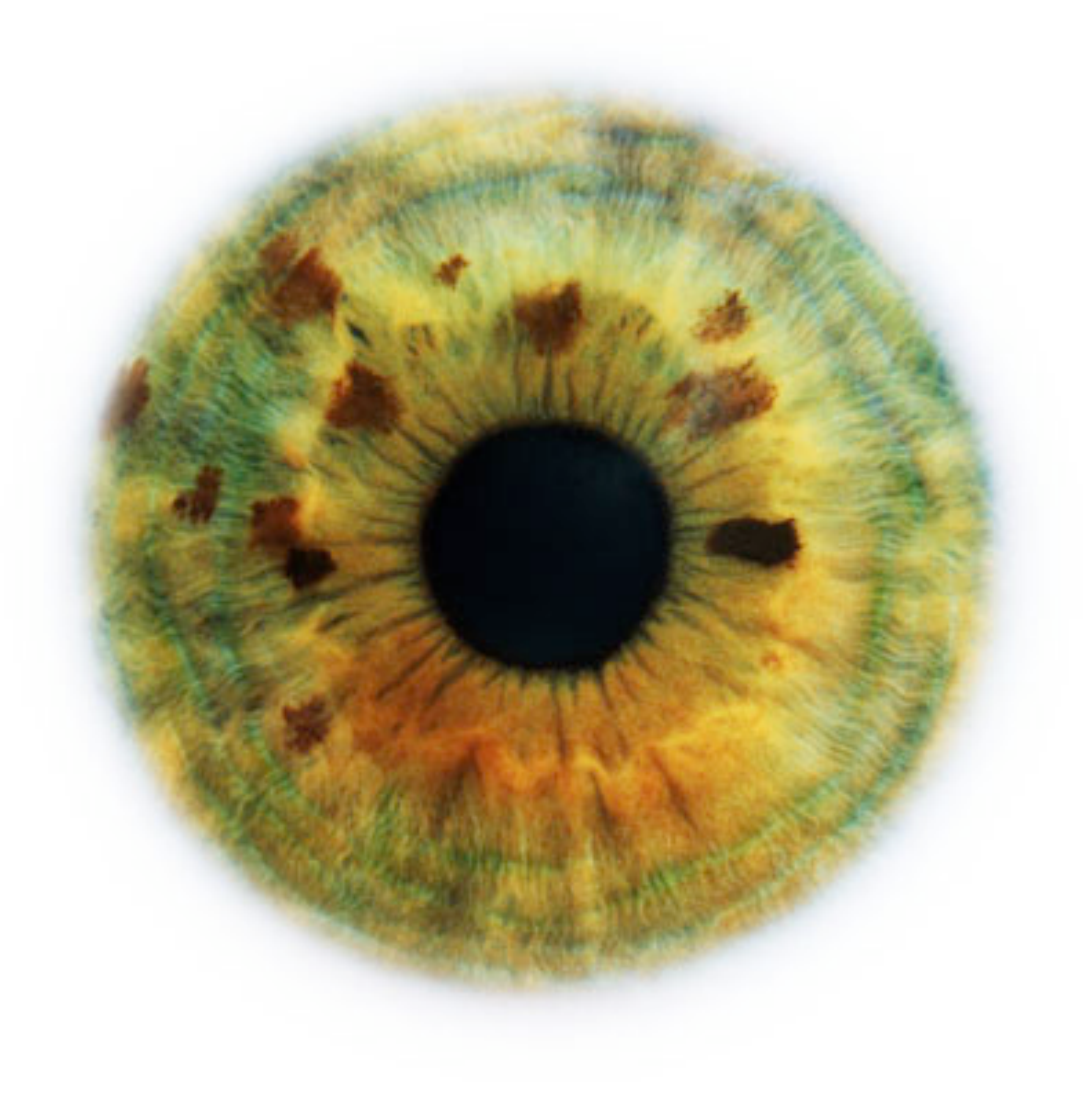

http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

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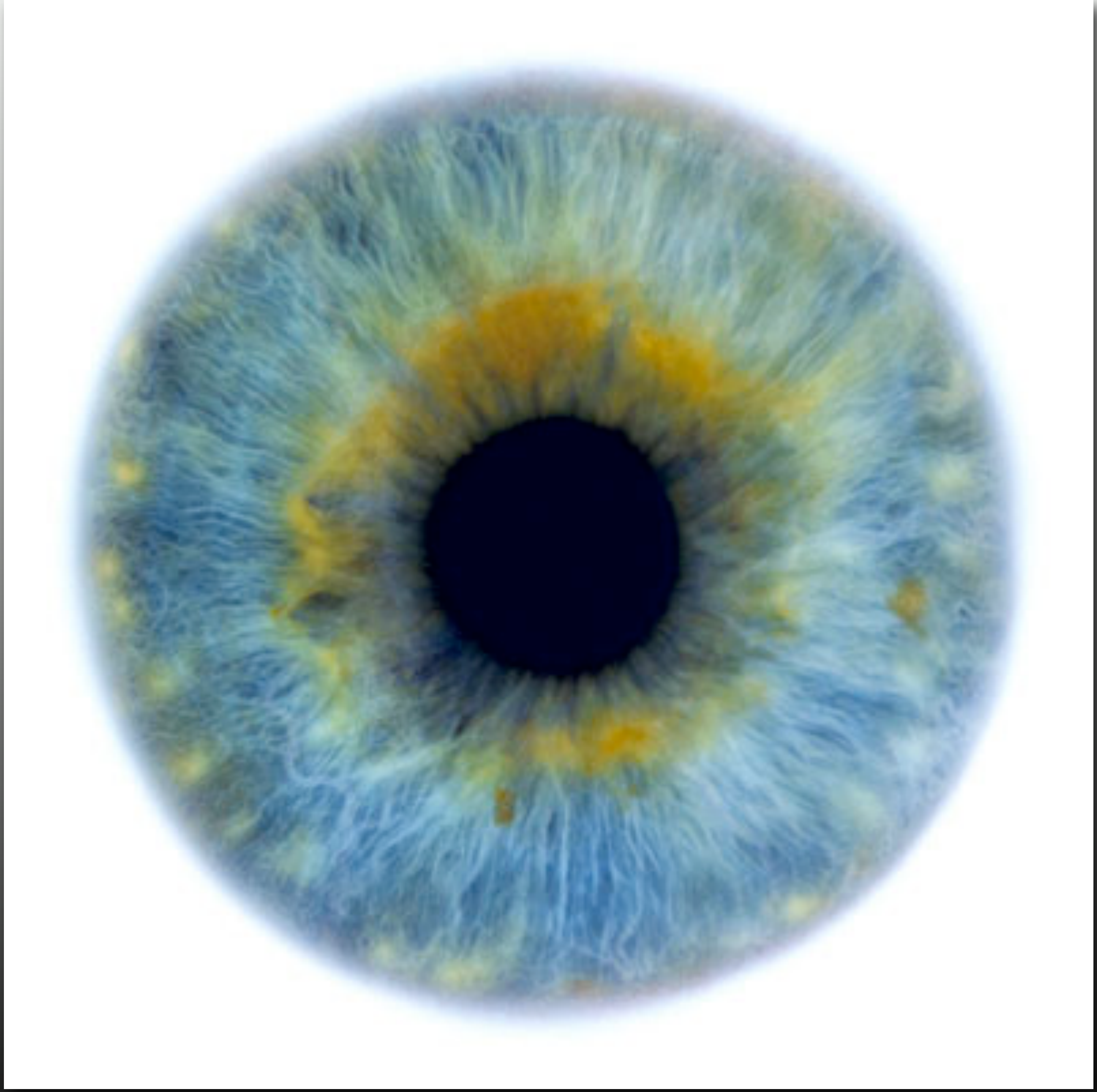

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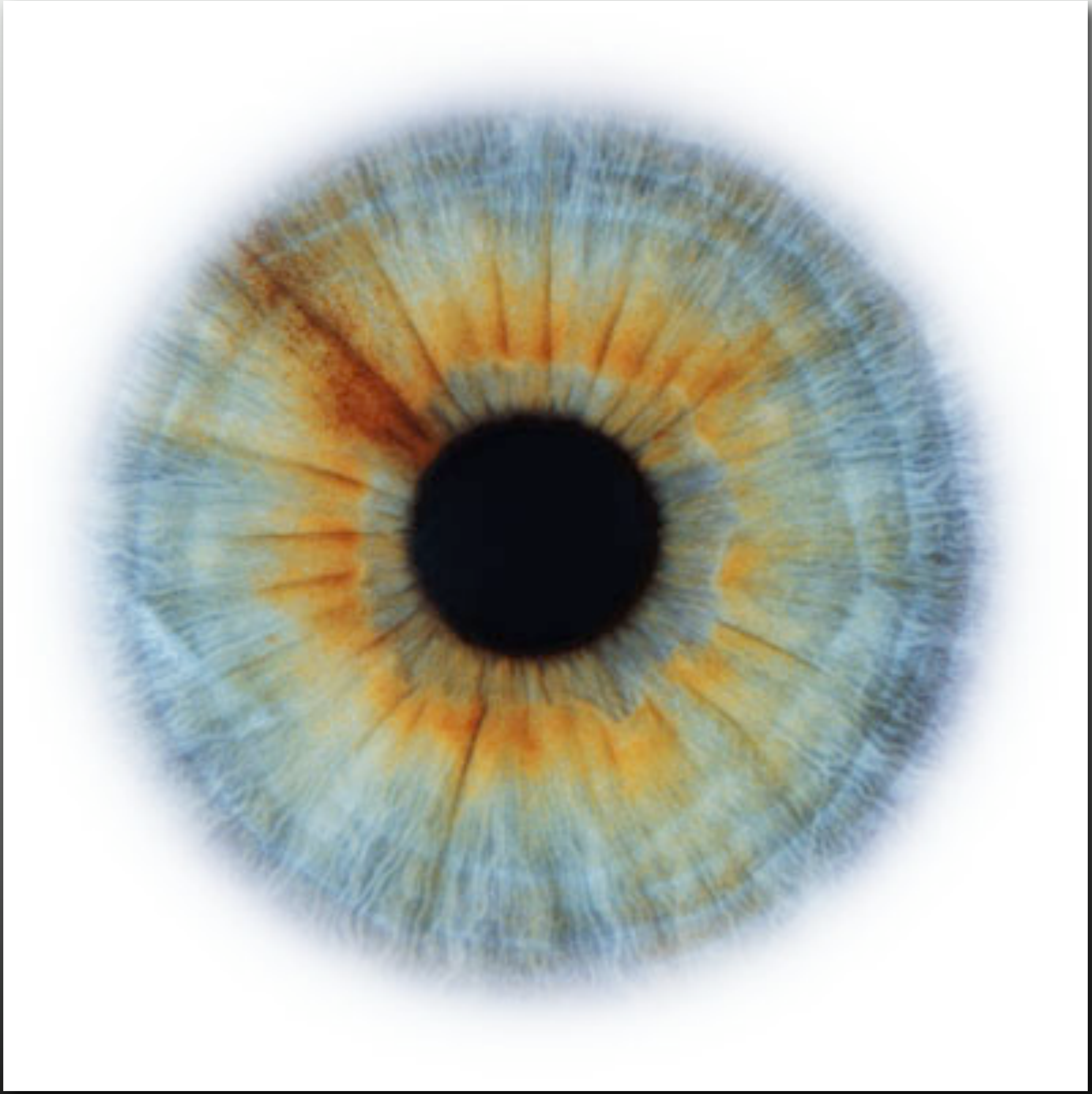

http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

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http://www.art-dept.com/artists/rankin/portfolio/specialprojects/eyescapes/portfolio.html

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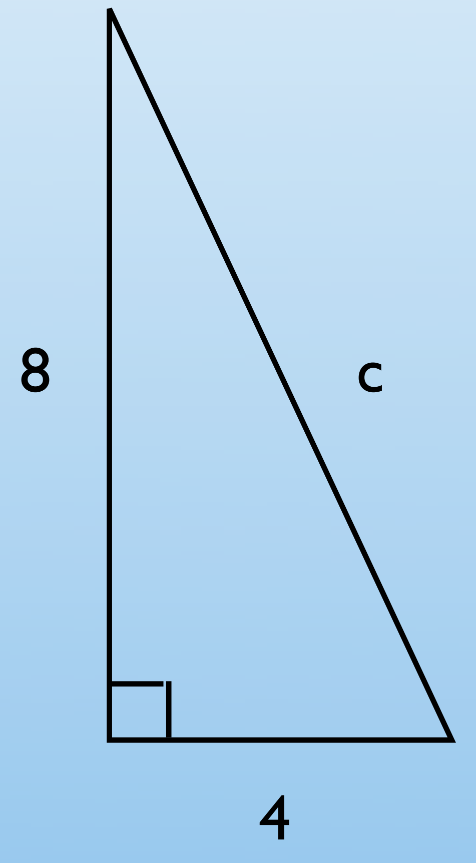
## 2. Simplifying Square Roots



$$a^2 + b^2 = c^2$$

$$8^2 + 4^2 = c^2$$

$$64 + 16 = c^2$$

$$80 = c^2$$

$$\sqrt{80} = c$$

$$8.94 = c$$

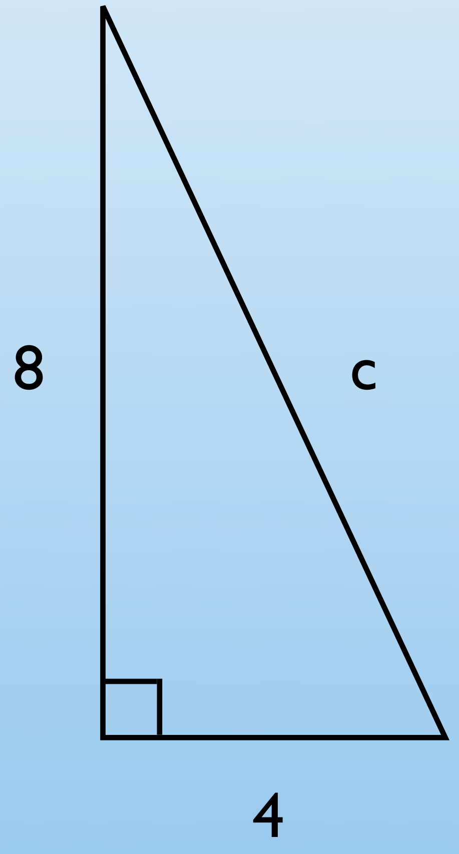
We’re throwing back here to the first right triangle we solved. At the time we left things at square root(80).

## 2. Simplifying Square Roots

$\sqrt{80}$

Squaring is all about making pairs out of numbers. Square rooting is all about getting rid of pairs.

# 2. Simplifying Square Roots



$$a^2 + b^2 = c^2$$

$$8^2 + 4^2 = c^2$$

$$64 + 16 = c^2$$

$$80 = c^2$$

$$\sqrt{80} = c$$

$$\boxed{8.94 = c}$$

$$\boxed{4\sqrt{5} = c}$$

So here’s the alternate answer.  Sometimes it’s useful to preserve the square root information, as we’ll make clear in the next classwork segment.

## 2. Simplifying Square Roots

$\sqrt{80}$

$\sqrt{75}$

$\sqrt{180}$

More problems.

# 2. Classwork - Simplifying Square Roots

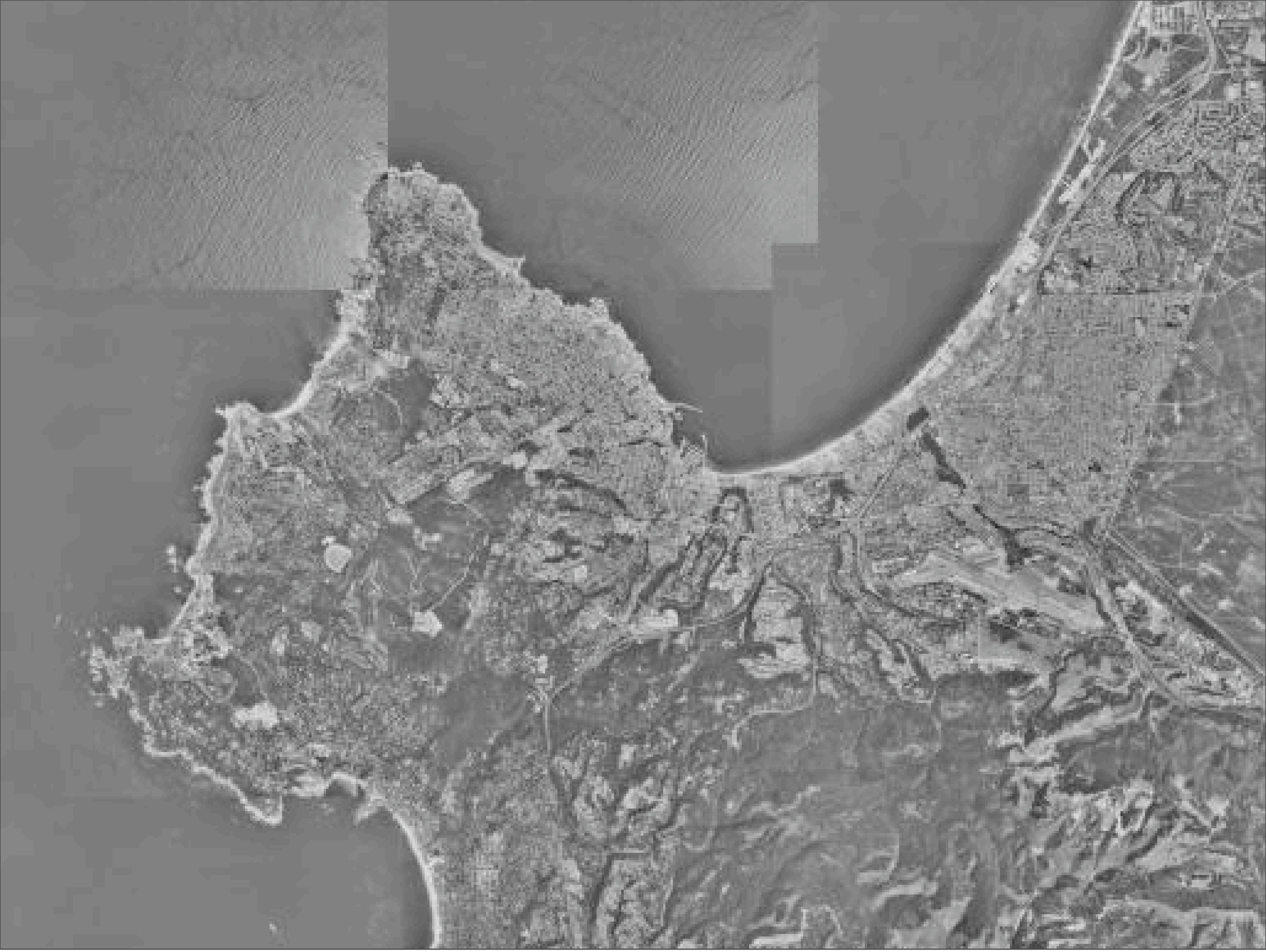
1. $\sqrt{18}$ $\boxed{3\sqrt{2}}$
2. $\sqrt{96}$ $\boxed{4\sqrt{6}}$
3. $\sqrt{576}$ $\boxed{24}$
4. $\sqrt{720}$ $\boxed{12\sqrt{5}}$
5. $\sqrt{722}$ $\boxed{19\sqrt{2}}$
6. $\sqrt{784}$ $\boxed{28}$
7. $\sqrt{828}$ $\boxed{6\sqrt{23}}$
8. $\sqrt{2952}$ $\boxed{6\sqrt{82}}$
9. $\sqrt{5248}$ $\boxed{8\sqrt{82}}$
10. $\sqrt{8200}$ $\boxed{10\sqrt{82}}$
11. $\sqrt{11808}$ $\boxed{12\sqrt{82}}$
12. $\sqrt{16072}$ $\boxed{14\sqrt{82}}$
13. $\boxed{\sqrt{20992}}$ $\boxed{16\sqrt{82}}$

For #13, tell them you want them to give you both the answer AND the question.

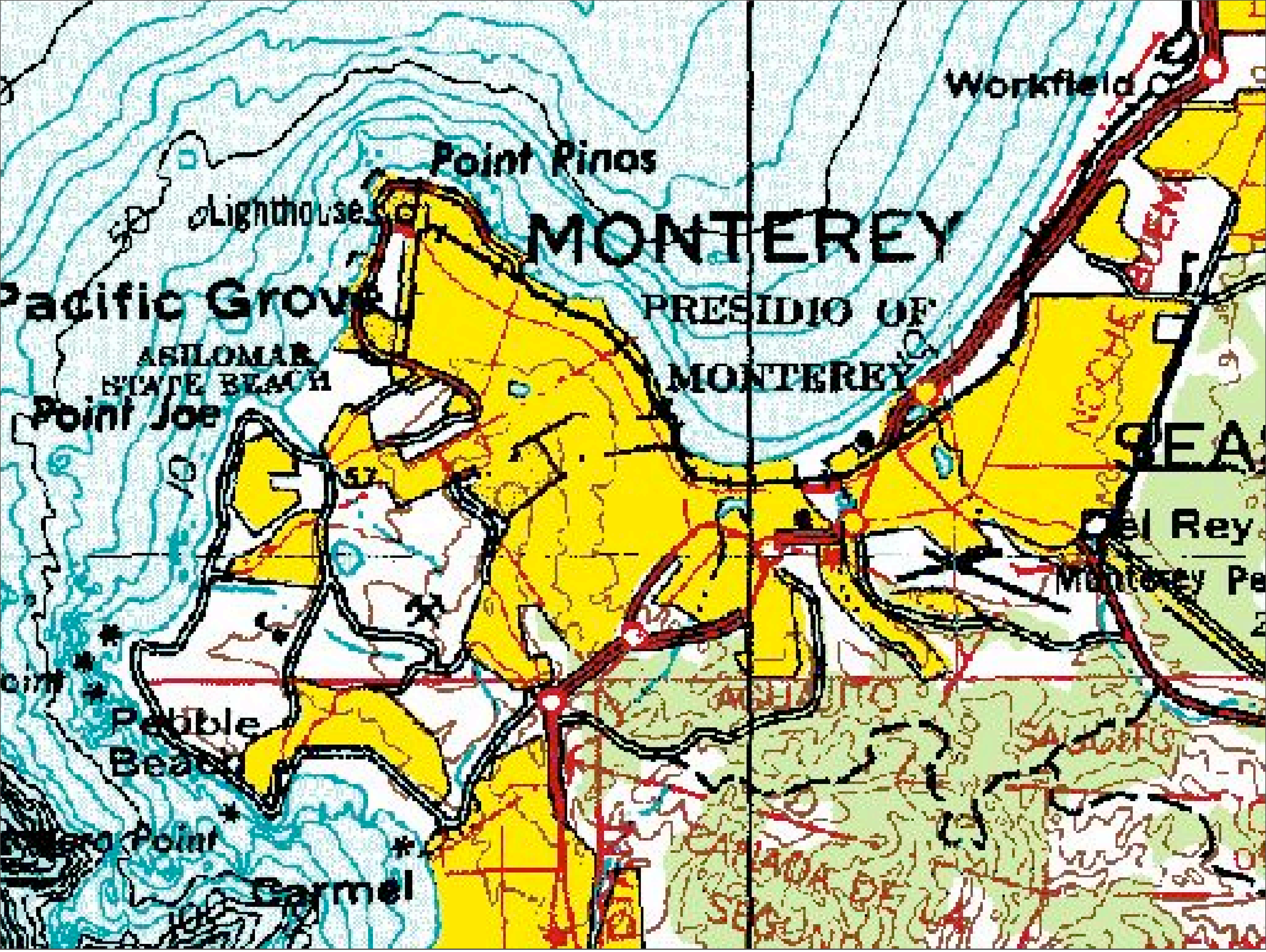
**3. Break**

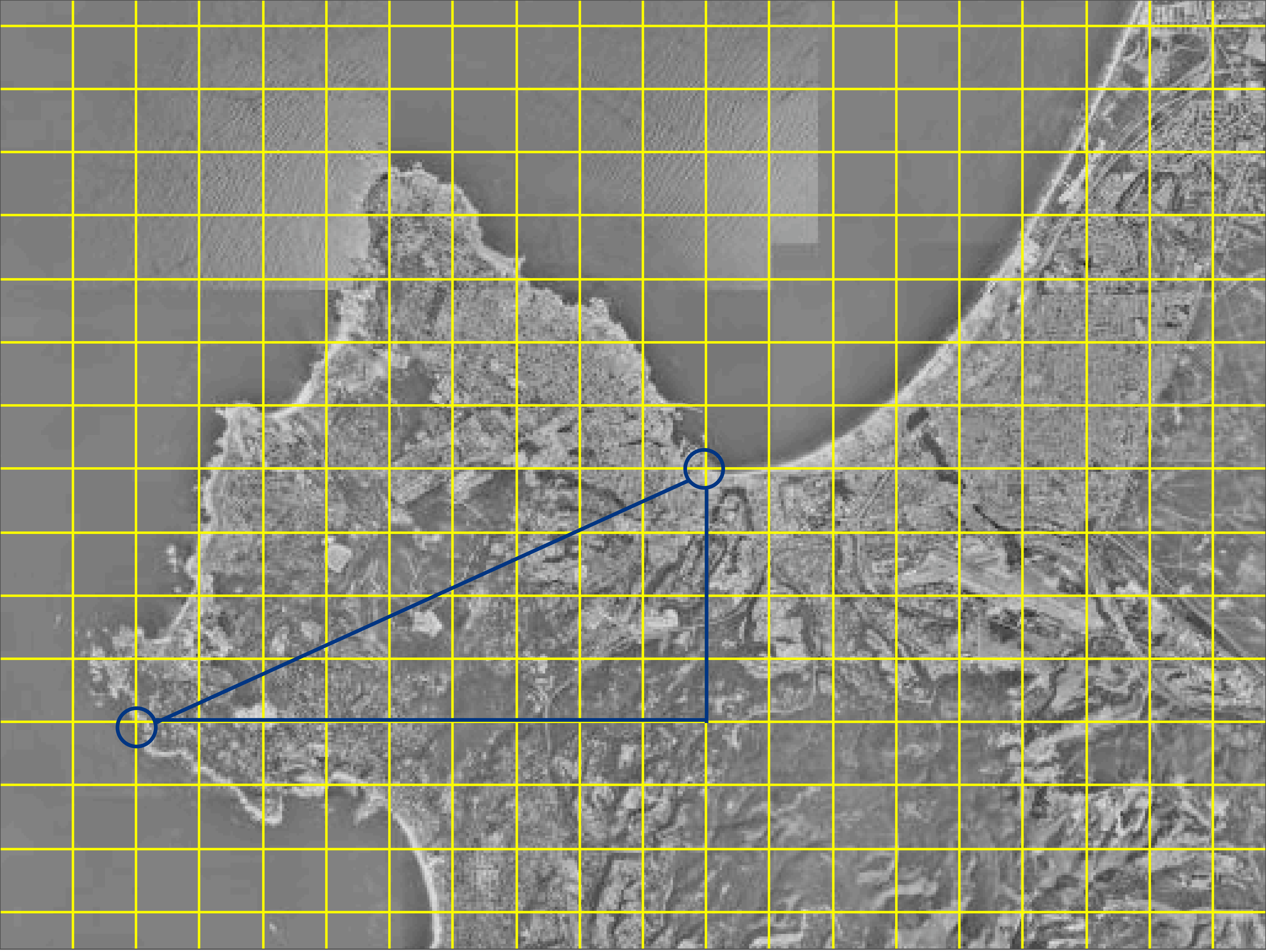
**4. Show and Tell**

For #13, tell them you want them to give you both the answer AND the question.



Monterey Bay, CA.

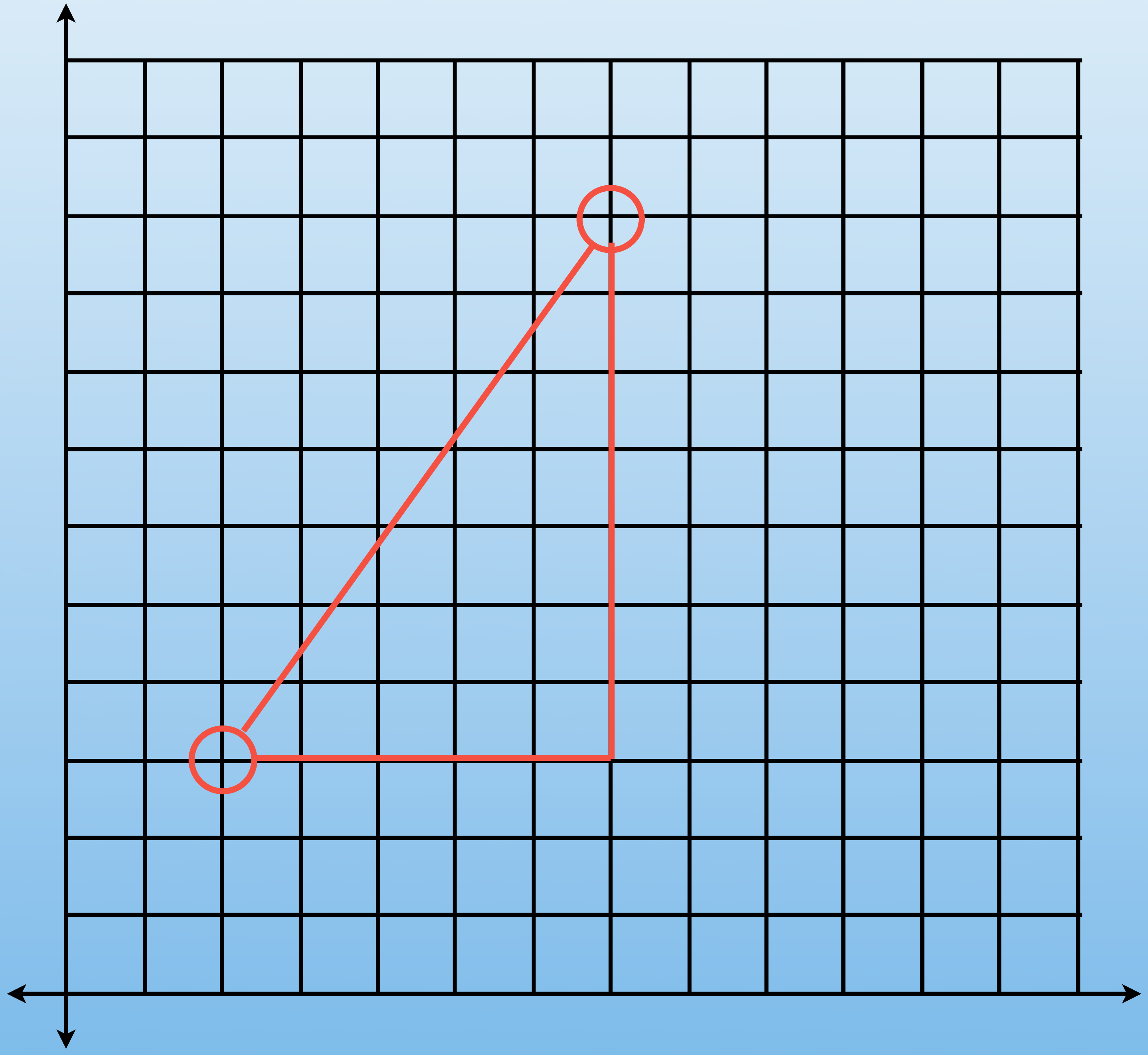

Workfield
Point Pinos
Lighthouses
MONTEREY
Pacific Grove
PRESIDIO OF
MONTEREY
ASILOMAR
STATE BEACH
Point Joe
Del Rey
Monterey
57
Pebble
Beach
Point
Carmel
AGUAJITO
SAUCITO



I want to know the distance, by air, from Pebble Beach to the Presidio. Each box in the grid is a square mile. (Not true, but let’s roll with it for argument’s sake.)

# 5. Distance Formula

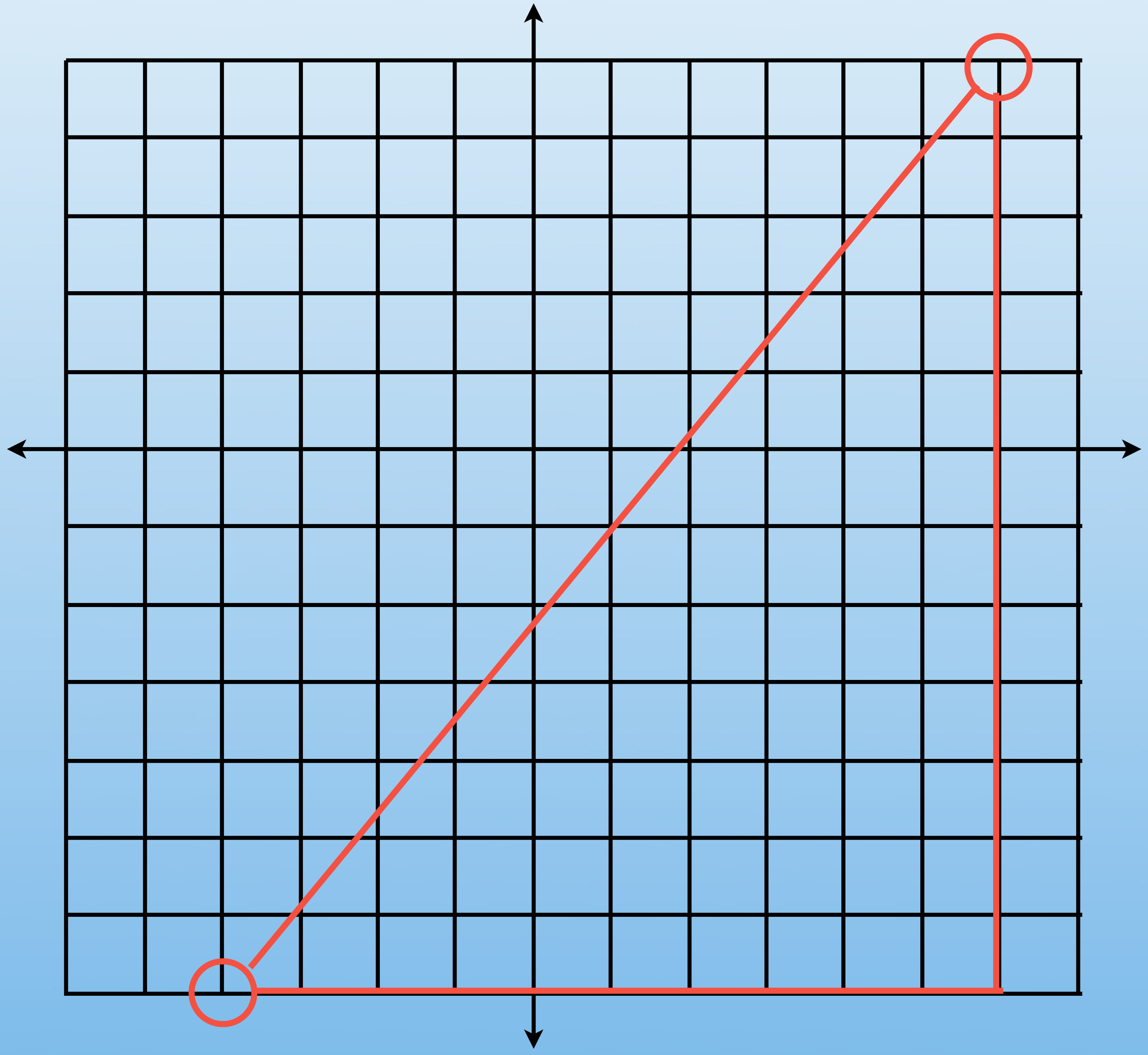
Find the distance between (2, 3) and (7,10).



They’ll count squares here.

# 5. Distance Formula

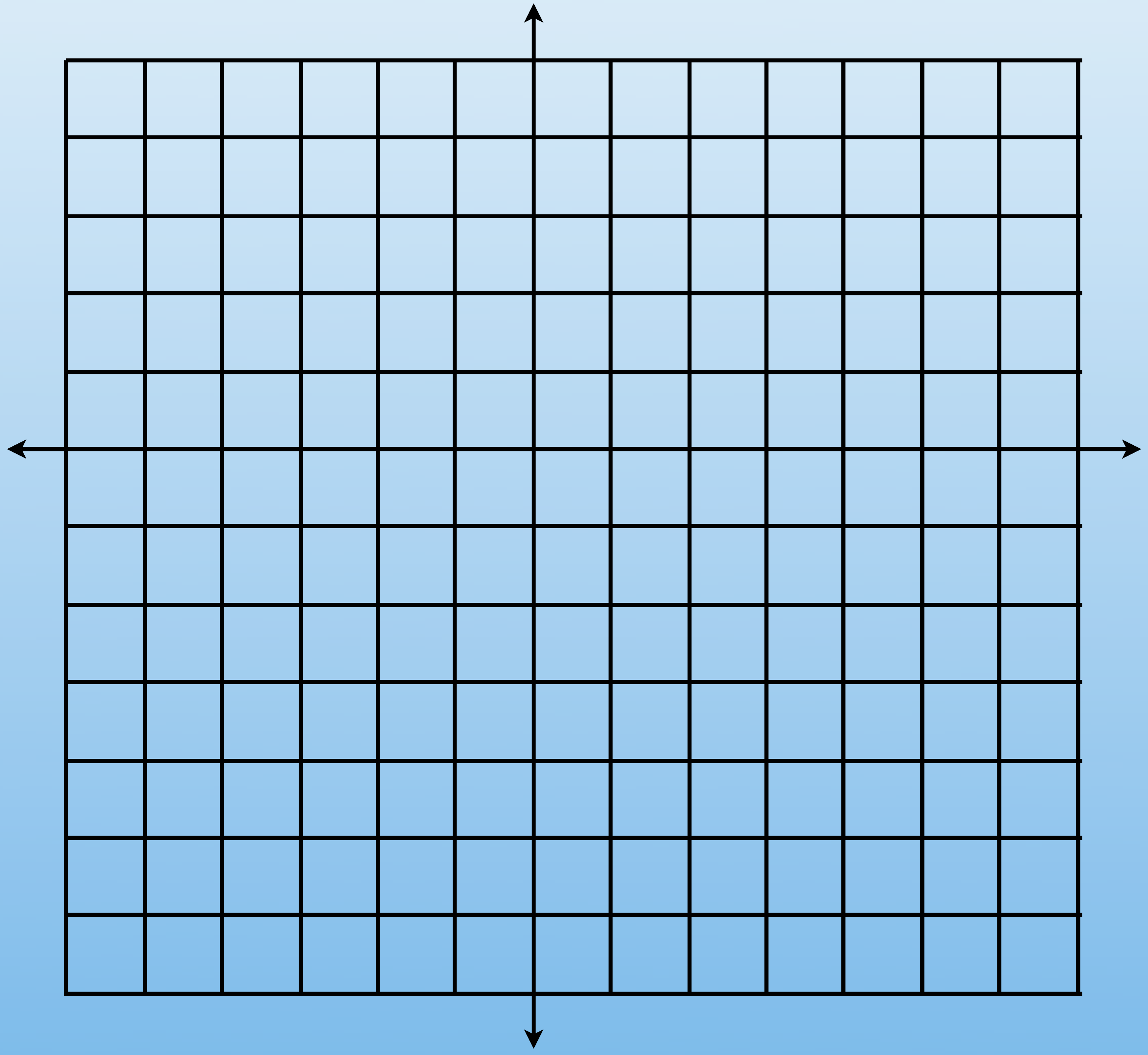
Find the distance between (-4, -7) and (6,5).



They’ll count squares here too.

## 5. Distance Formula

Find the distance between (50, 23) and (74, 30).



Here, they can’t count squares. So what do you do?

## 5. Distance Formula

Find the distance between $(x_1, y_1)$ and $(x_2, y_2)$.

Conjecture #3:

Distance Formula

The distance between points $(x_1, y_1)$ and $(x_2, y_2)$ is:

[redacted]

Classwork:

1. Find the distance between:
   (15, 37) and (42, 73).
2. Find the distance between:
   (-19, -16) and (-3, 14).
3. What is the perimeter of triangle ABC given:
   A(2, 4), B(8, 12), C(24, 0)?
4. Is triangle DEF scalene, isosceles, or equilateral given:
   D(6, -6), E(39, -12), F(24, 18)?

Give what they've done on the last several problems, have them derive the formula.

# 6. Classwork

Pythagorean Worksheet

Give what they’ve done on the last several problems, have them derive the formula.

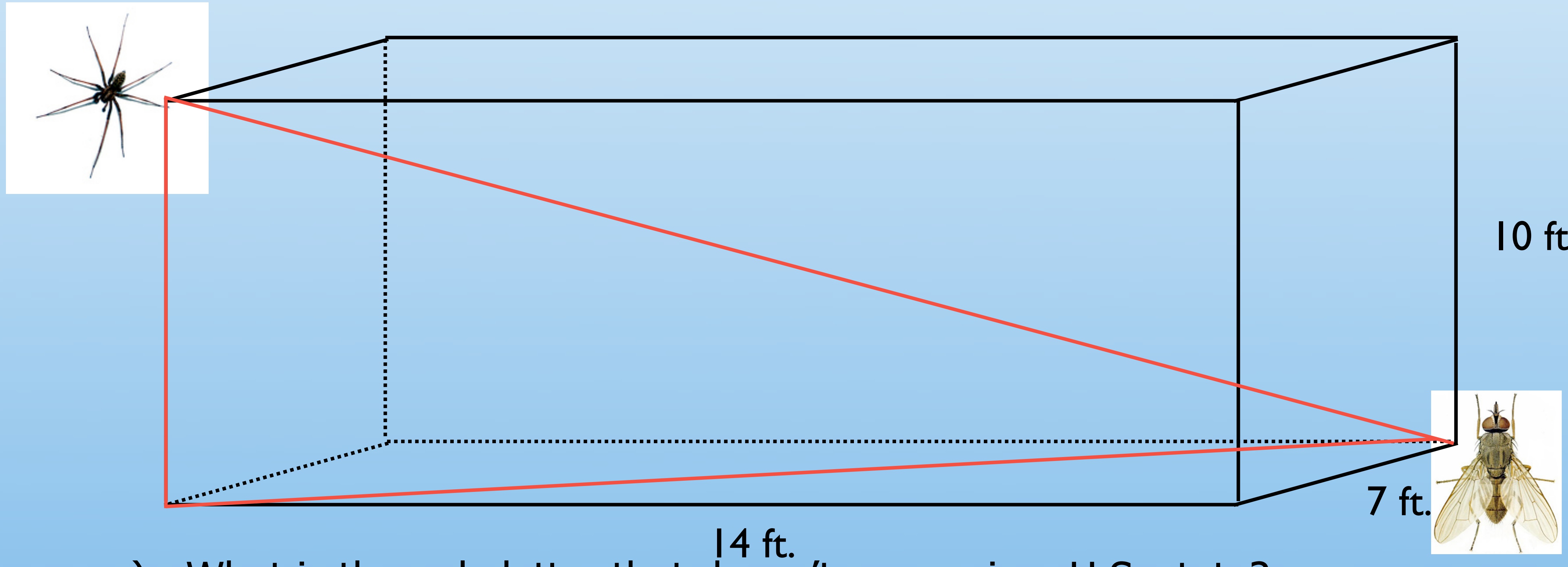
# Day 75

## 1. Opener

A spider and a fly are at opposite corners of a rectangular room that measures 14 ft. x 7 ft. x 10 ft.

a) What is the distance between them?

b) What is the shortest path the spider could take to eat the fly?



c) What is the only letter that doesn't appear in a U.S. state?

Q. The animation here shows the path of the fly to the spider and then the right triangle. Do easier problems for the treasure hunt.

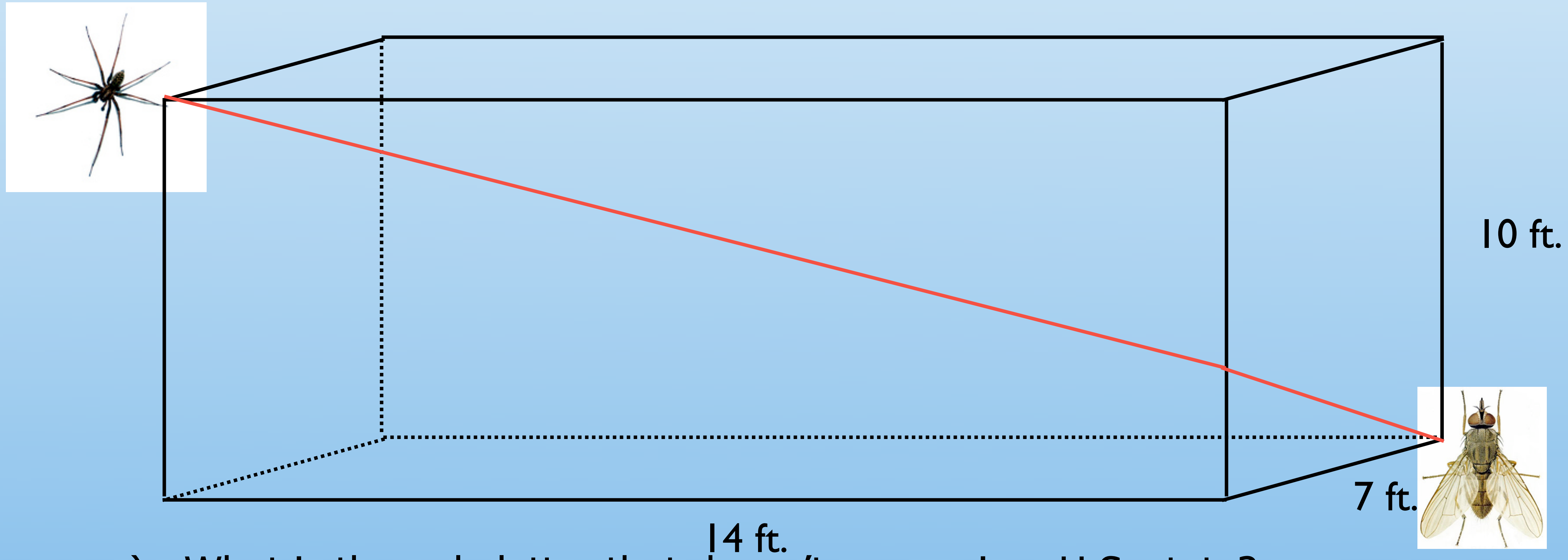
## Day 75

### 1. Opener

A spider and a fly are at opposite corners of a rectangular room that measures 14 ft. x 7 ft. x 10 ft.

a) What is the distance between them?

b) What is the shortest path the spider could take to eat the fly?



c) What is the only letter that doesn't appear in a U.S. state?

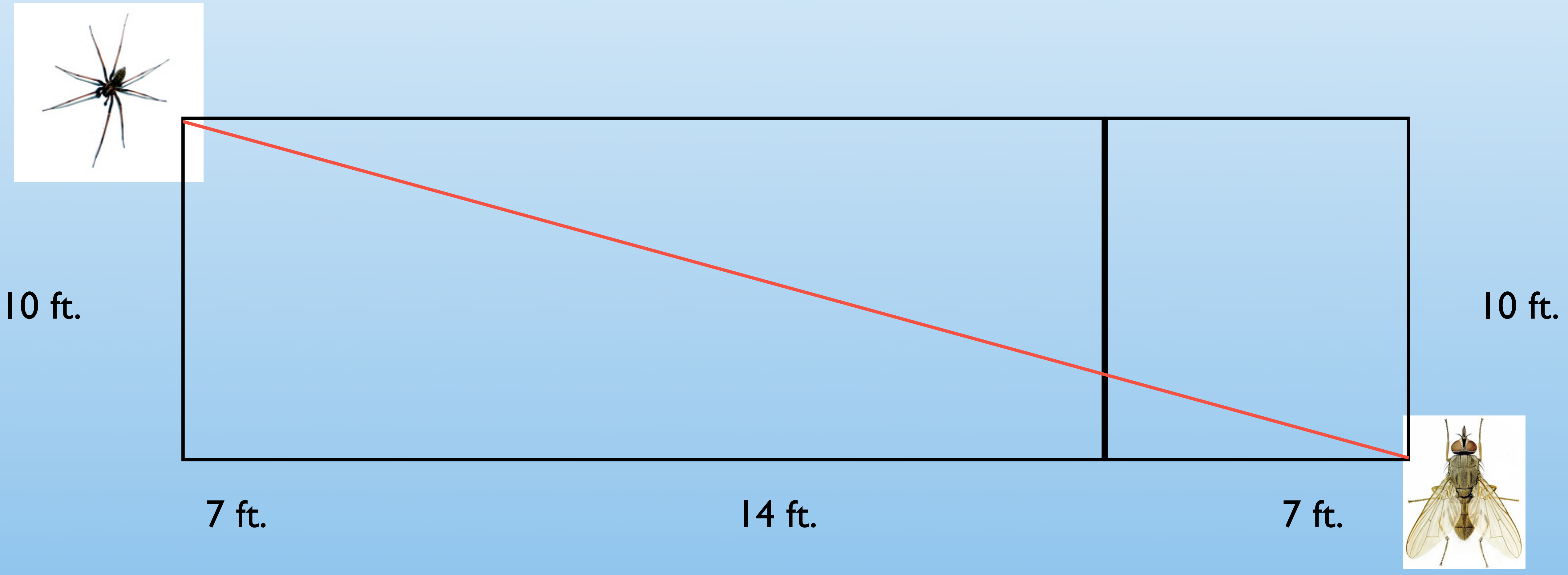
Animating the path from the spider to the fly.

# Day 75

## 1. Opener

A spider and a fly are at opposite corners of a rectangular room that measures 14 ft. x 7 ft. x 10 ft.

b) What is the shortest path the spider could take to eat the fly?



c) What is the only letter that doesn't appear in a U.S. state?

Expanding the box to show the path is a straight line.

## CST Toolkit

# Released Question #10

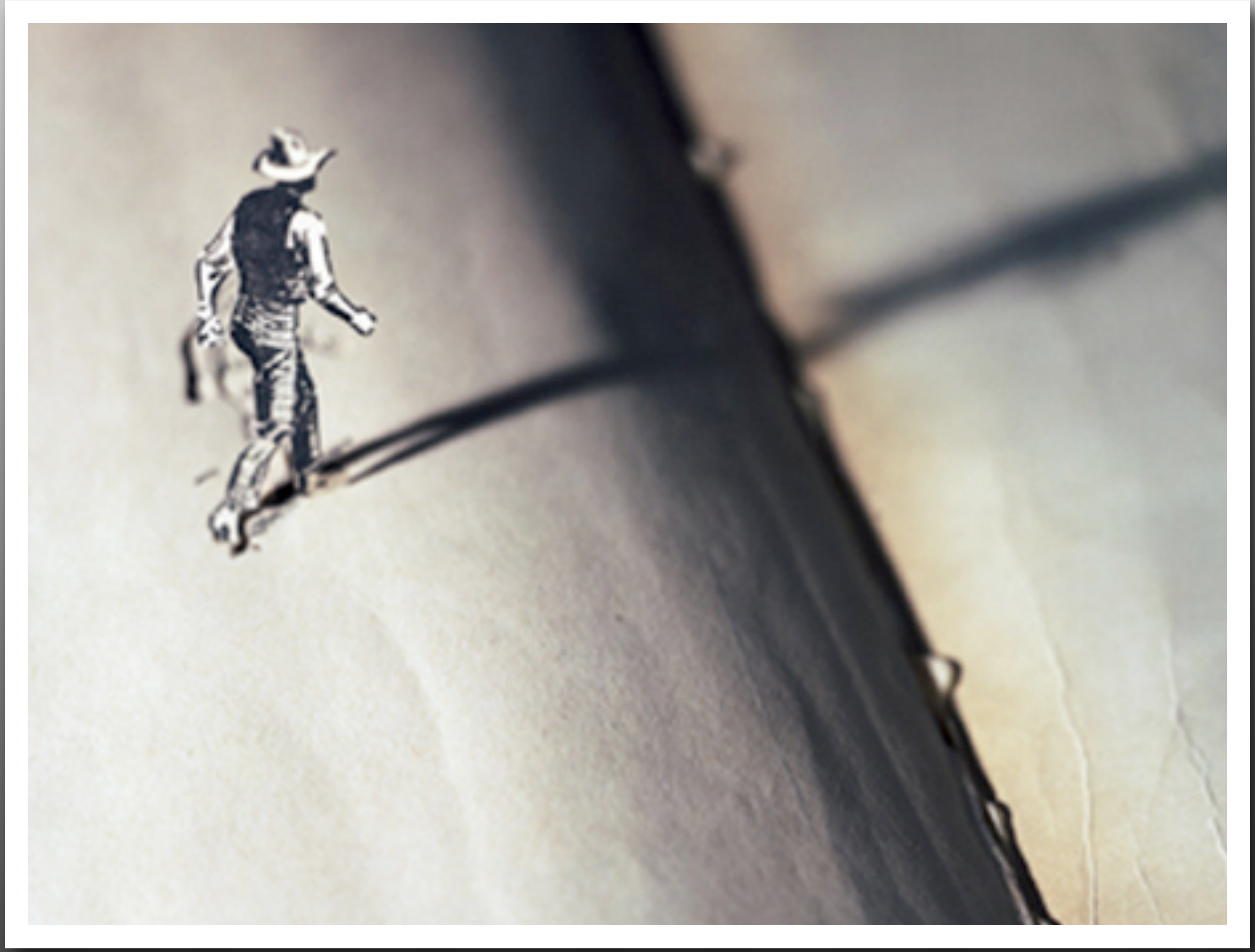
Given TRAP is an isosceles trapezoid with diagonals RP and TA. Which of the following must be true?

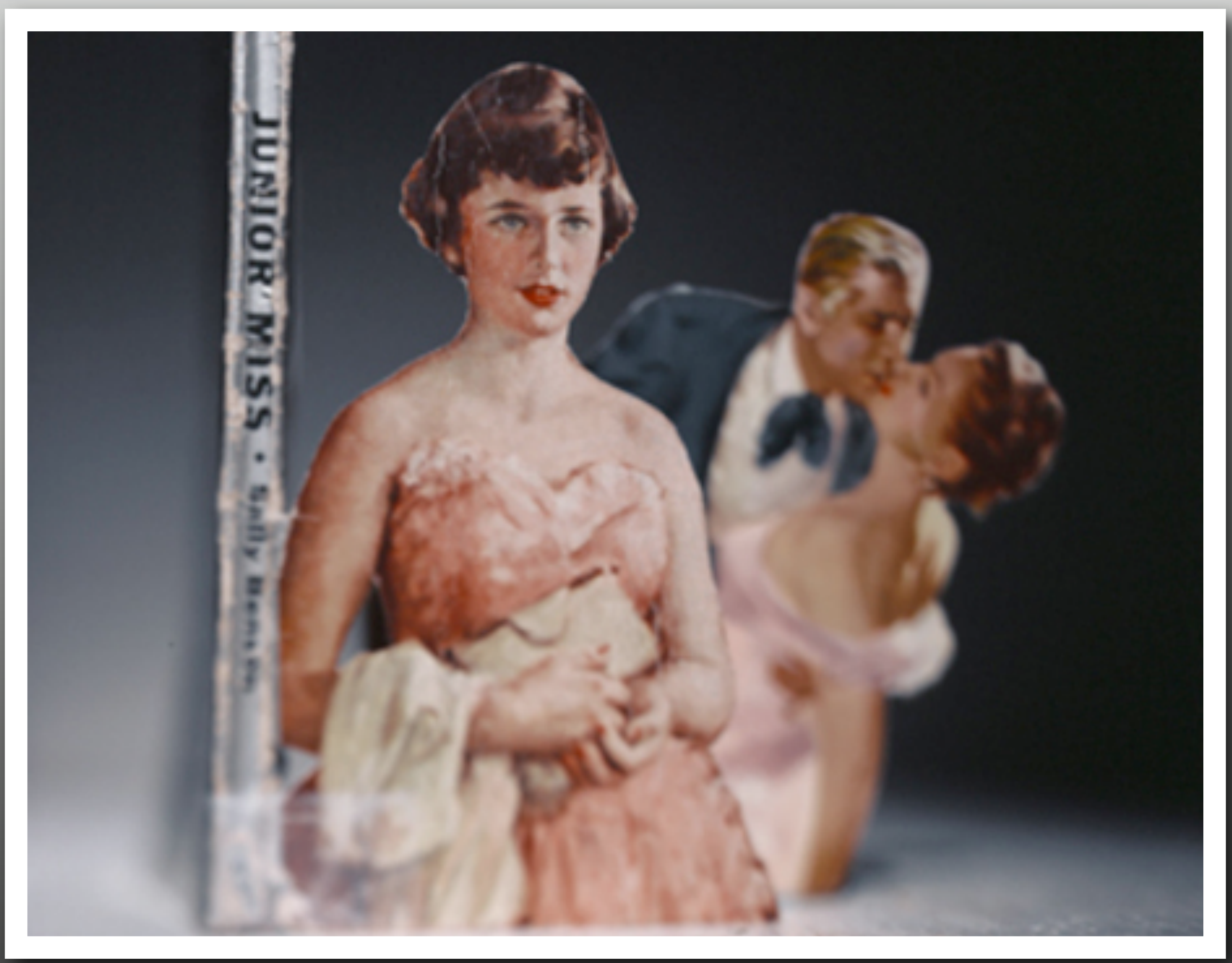
**A.** RP ≅ TA

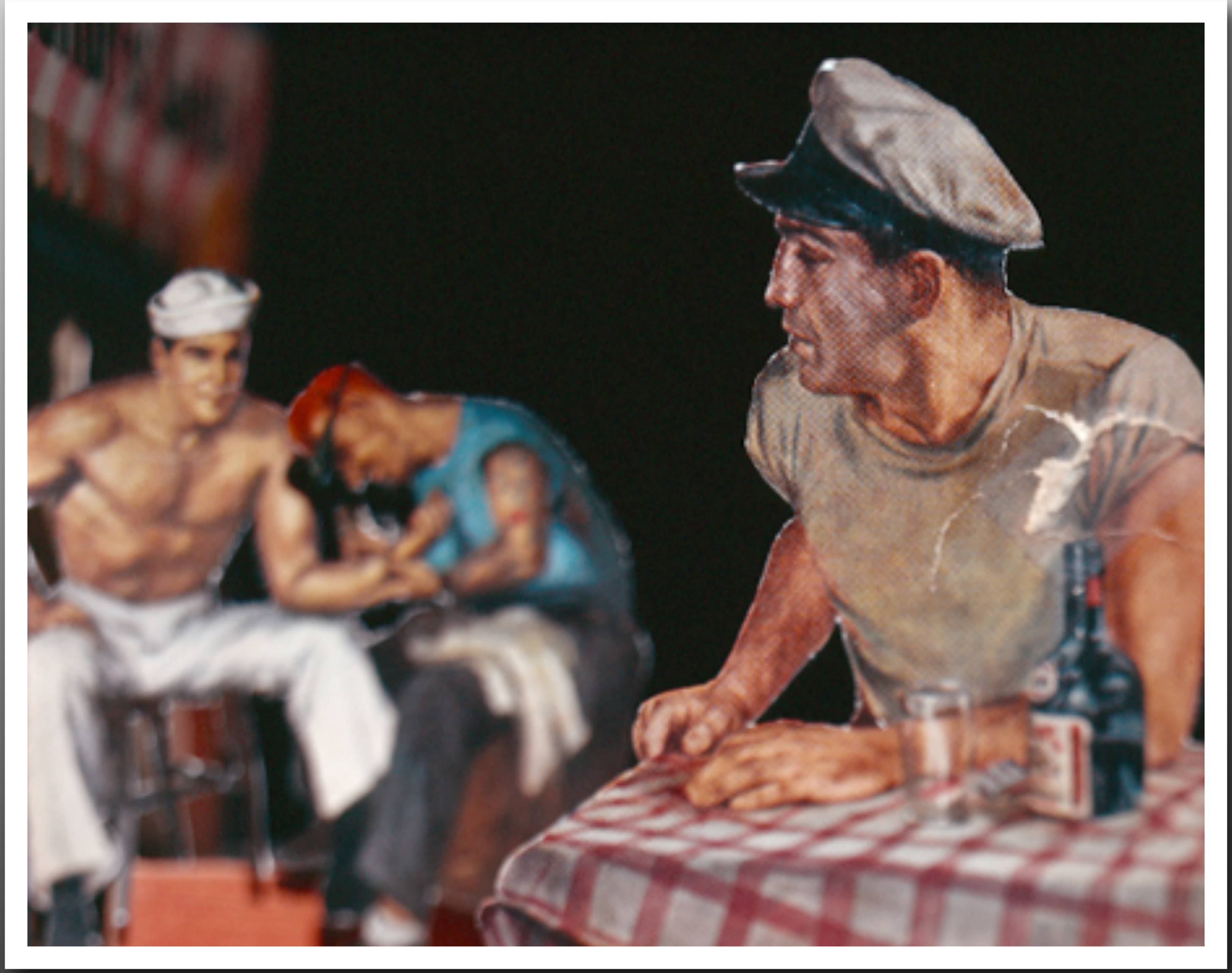
**B.** RP ⊥ TA

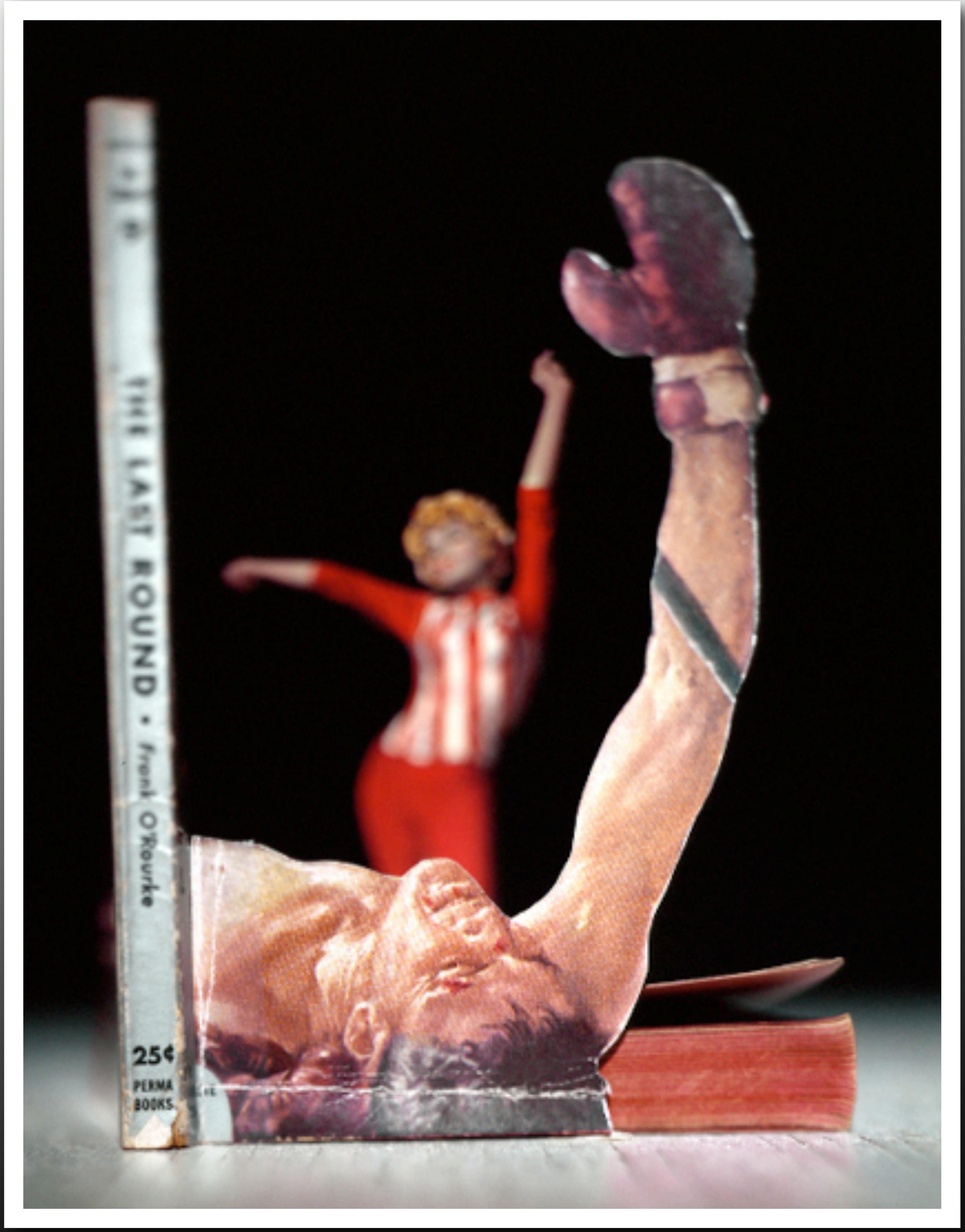
**C.** RP || TA

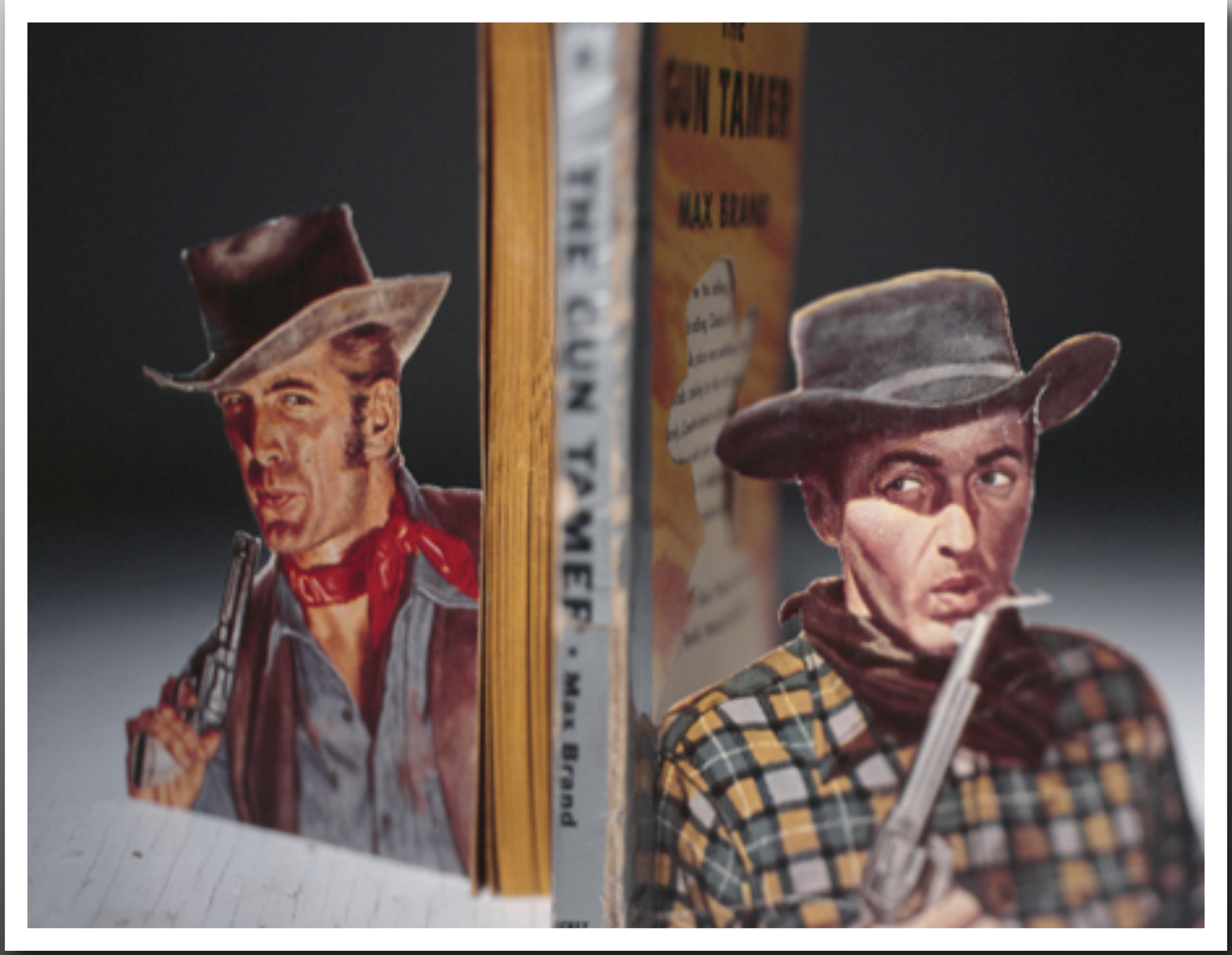
**D.** RP bisects TA

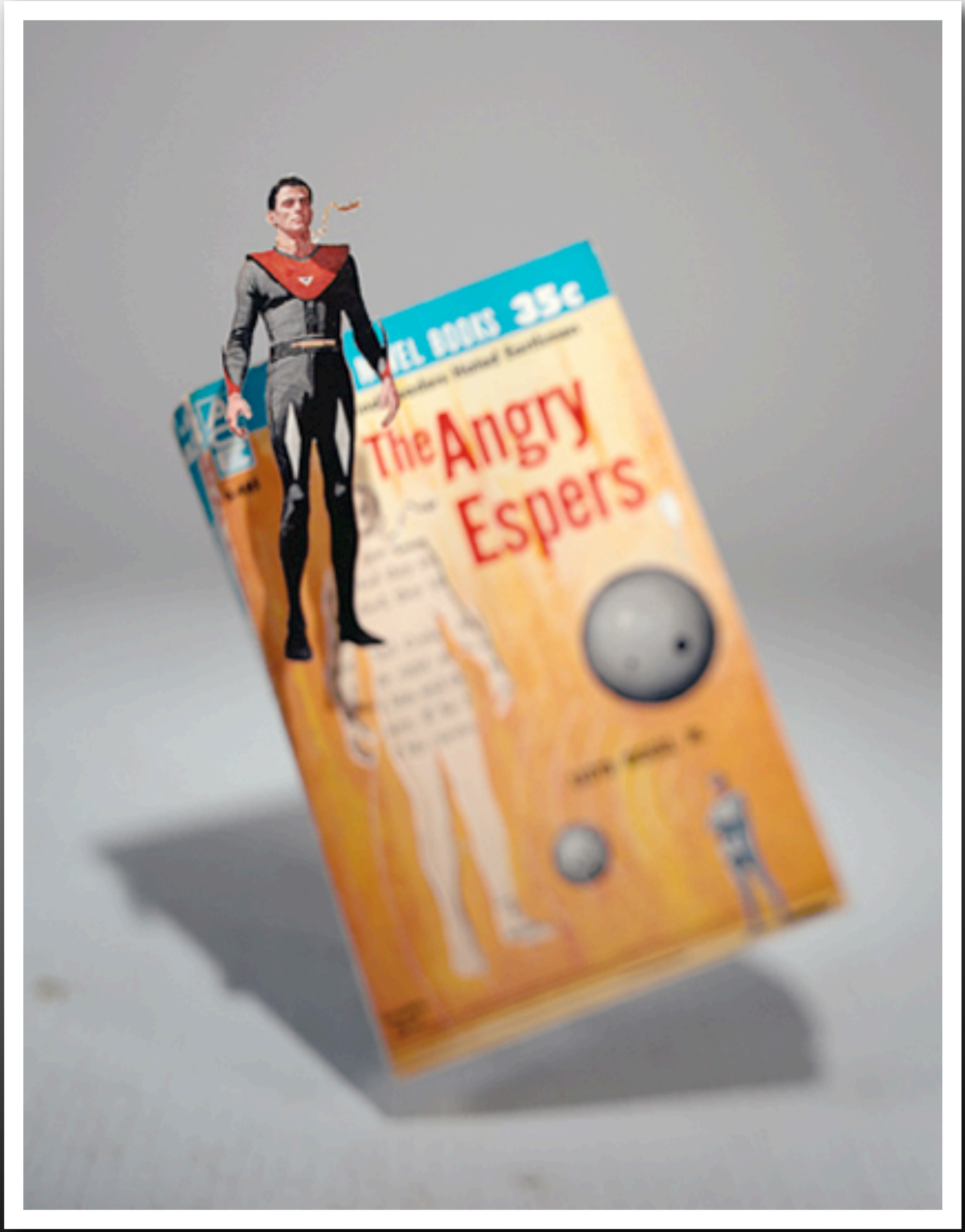


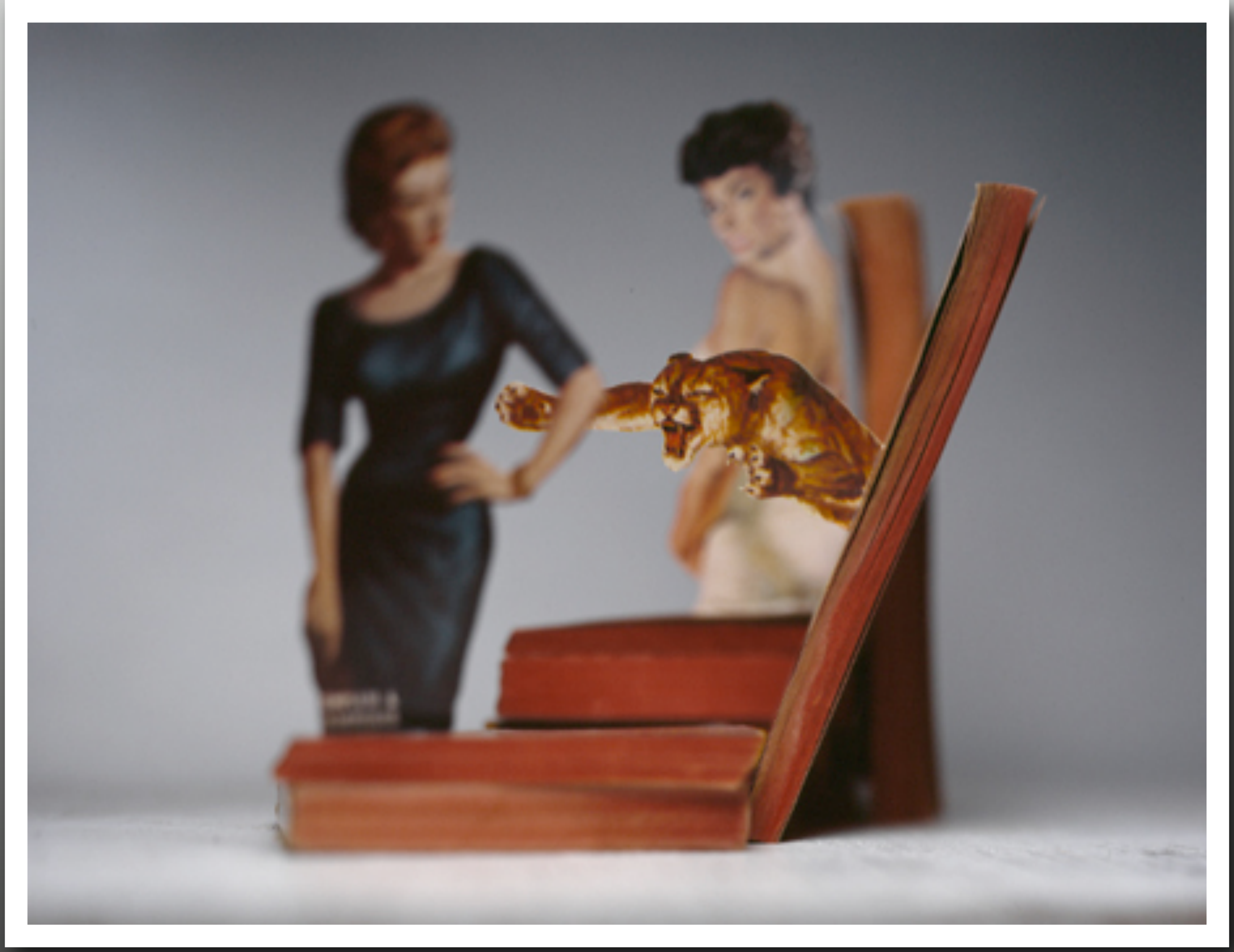

JUNIOR MISS • Sally Benson



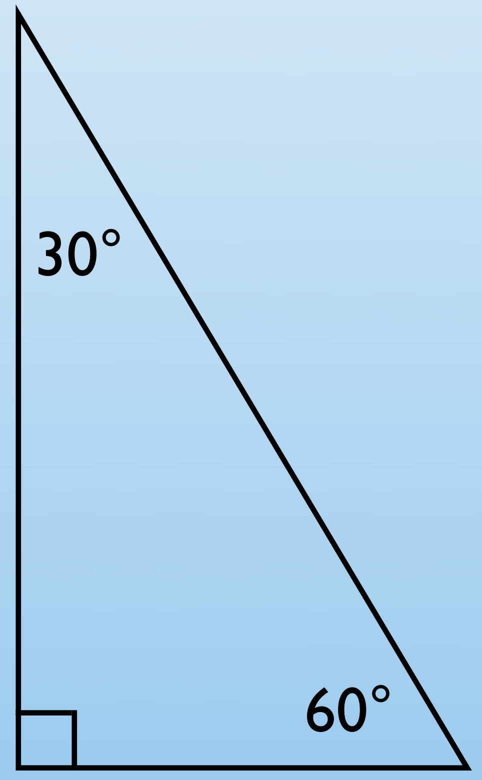

THE LAST ROUND • Frank O'Rourke
25¢
PERMA BOOKS

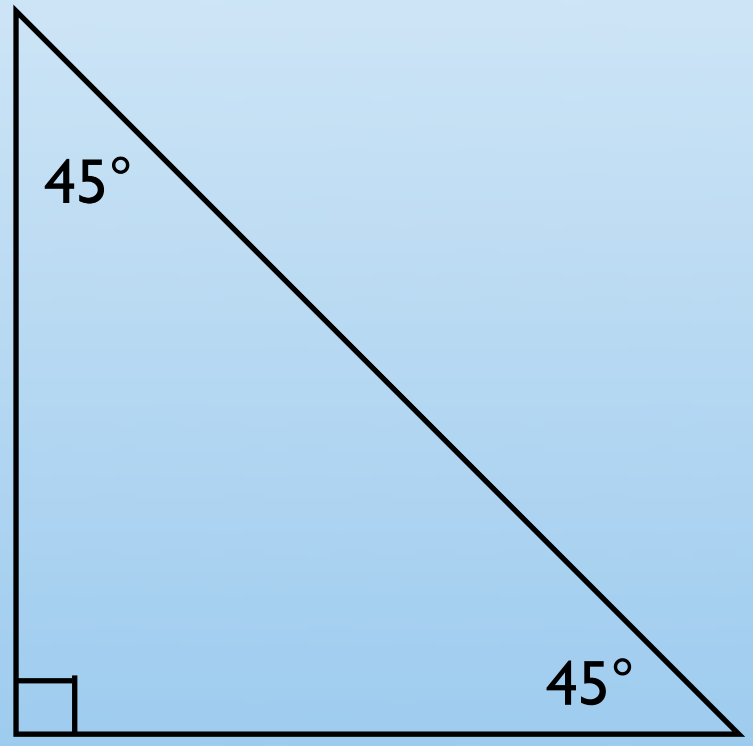

THE GUN TAMER • Max Brand
THE GUN TAMER
MAX BRAND


BOOKS 35¢
The Angry Espers



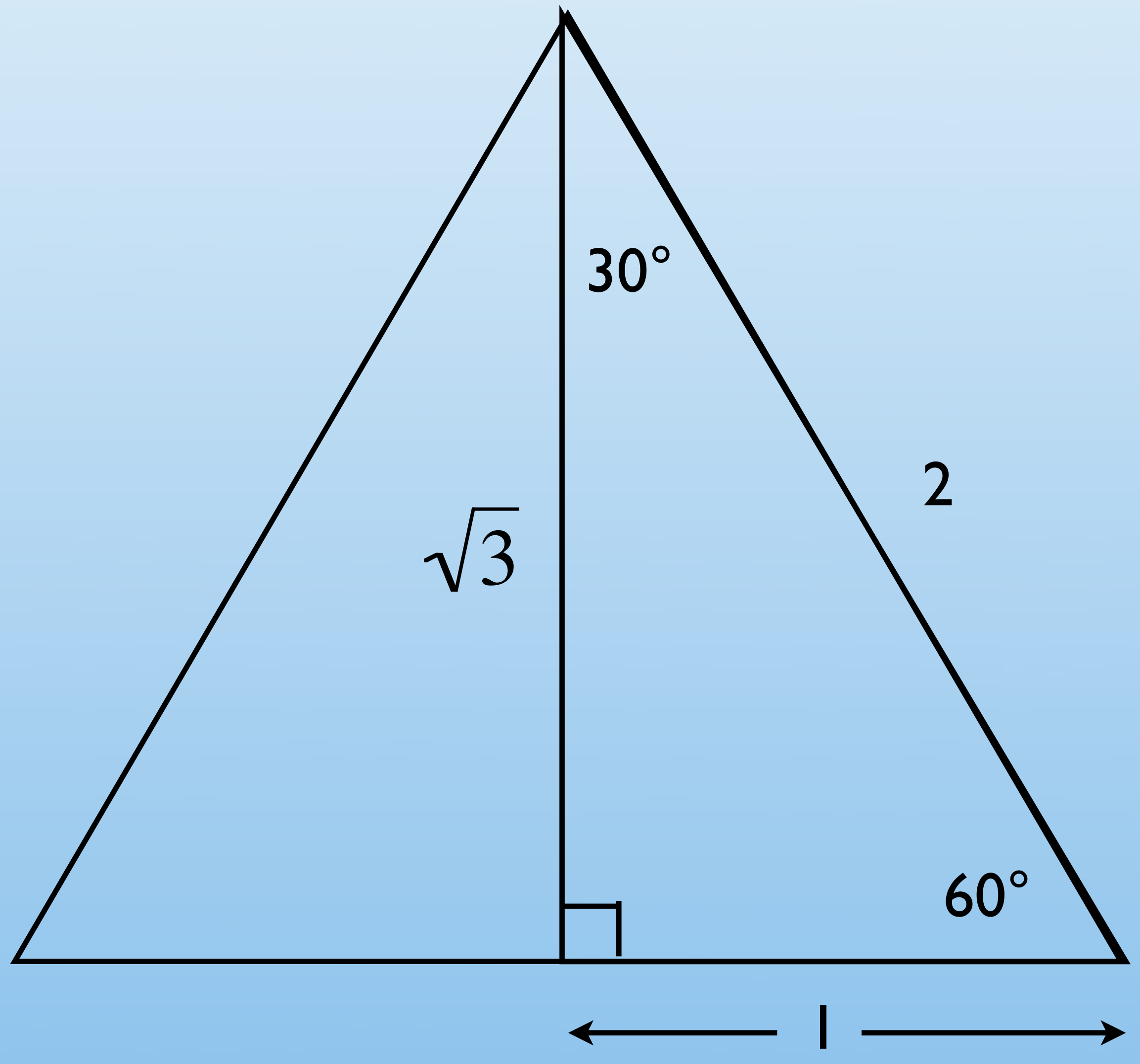
# 2. Special Right Triangles





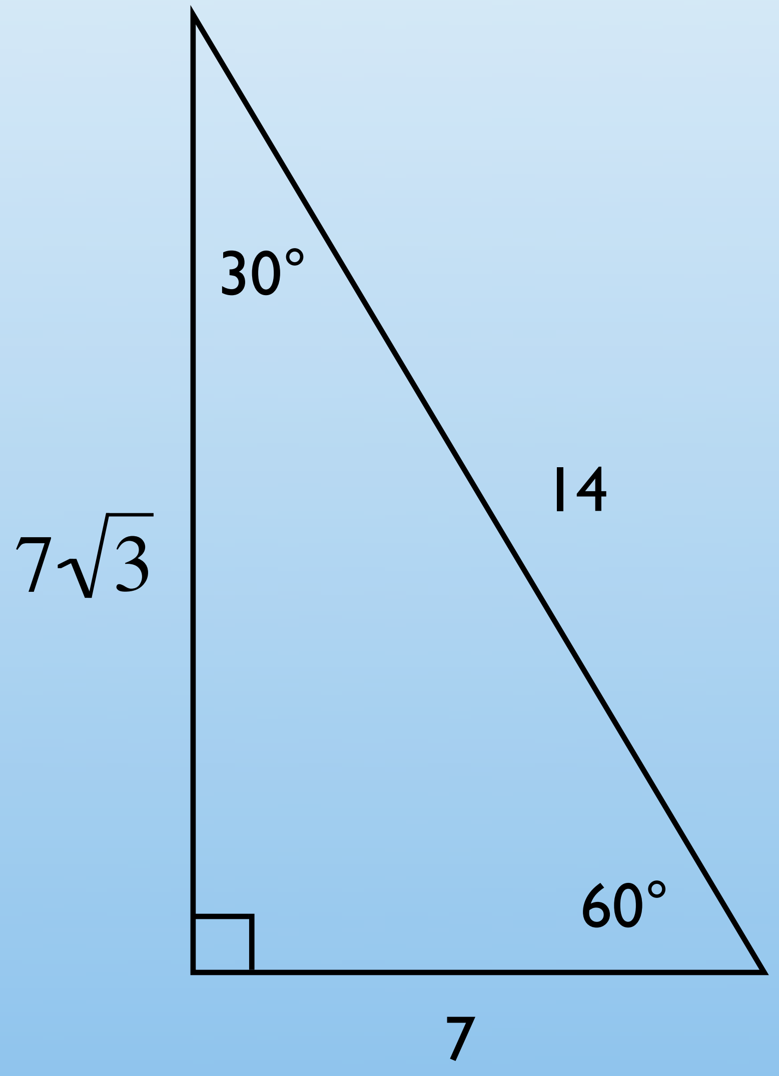
Why are they special?

## 2. 30 - 60 - 90


30°
$\sqrt{3}$
2
60°
1

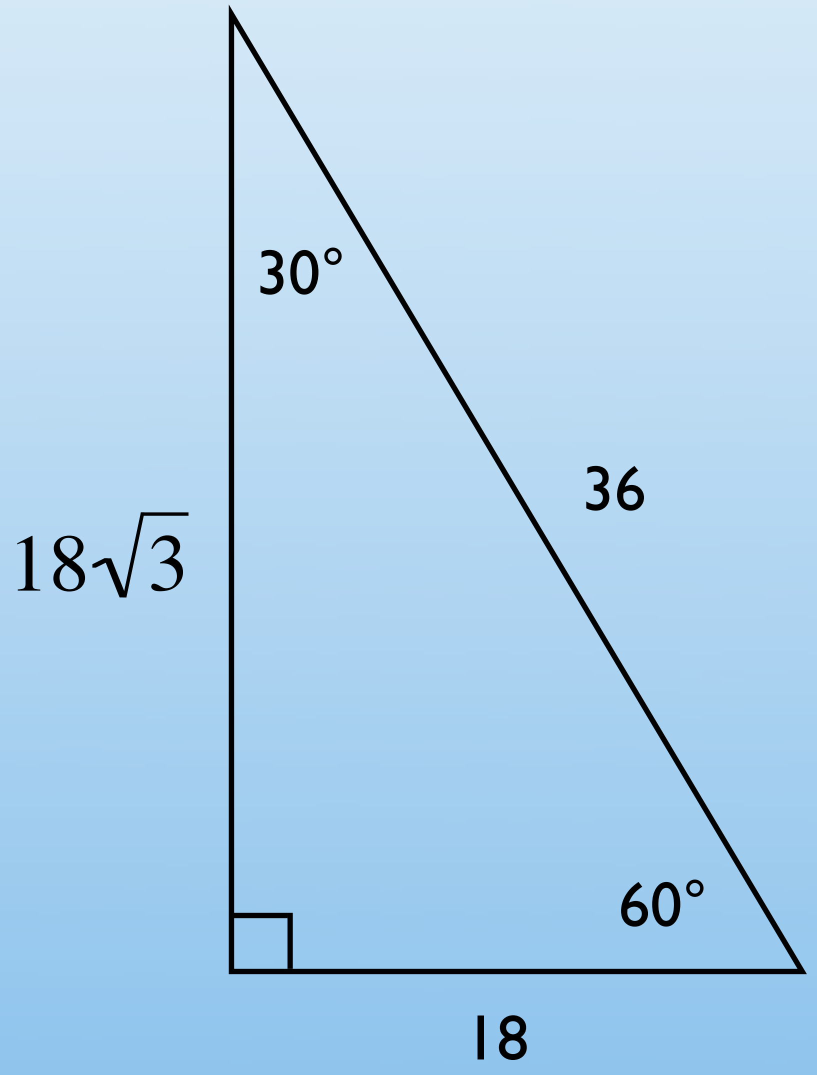
The 30-60-90 is one half the equilateral triangle.

## 2. 30 - 60 - 90

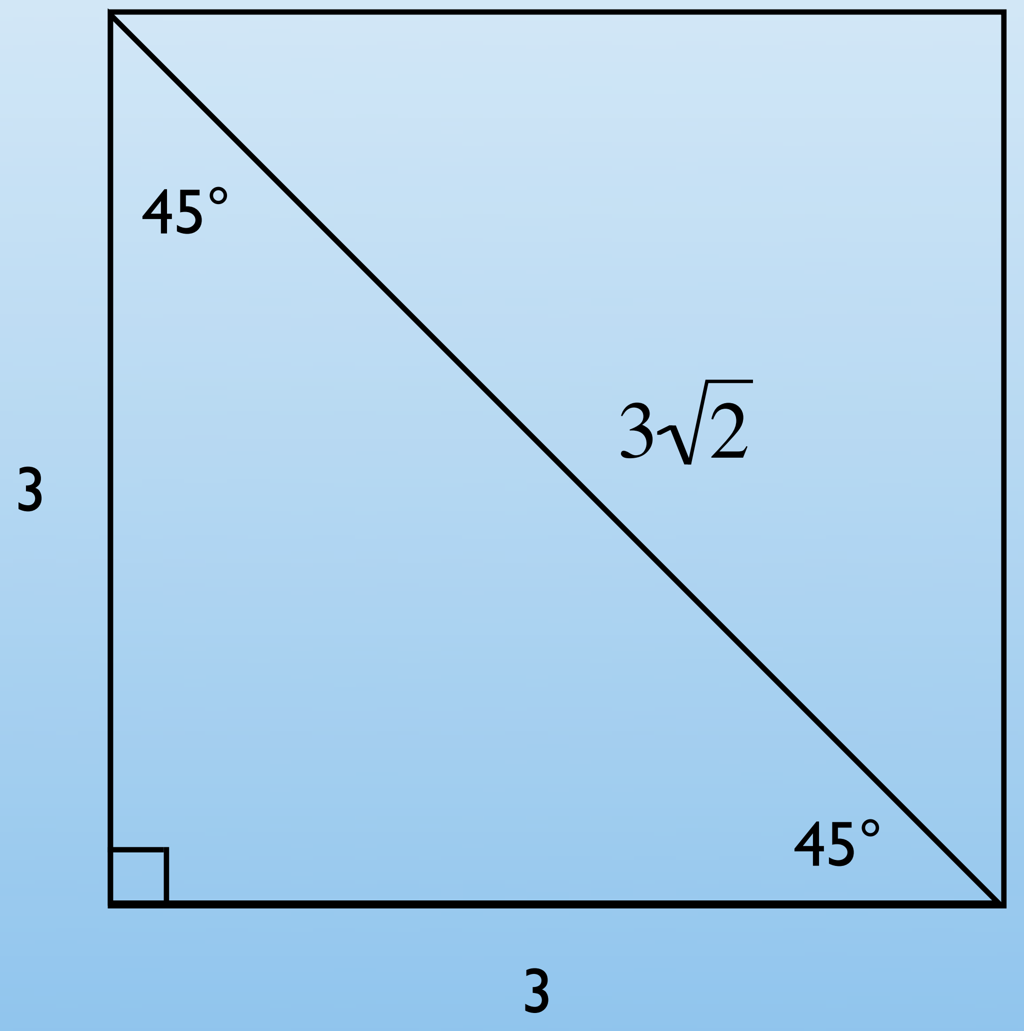

30°
14
$7\sqrt{3}$
60°
7

If the small side is 7, what is the largest side?  Then Pythagorize them to find the middle side.

# 2. 30 - 60 - 90

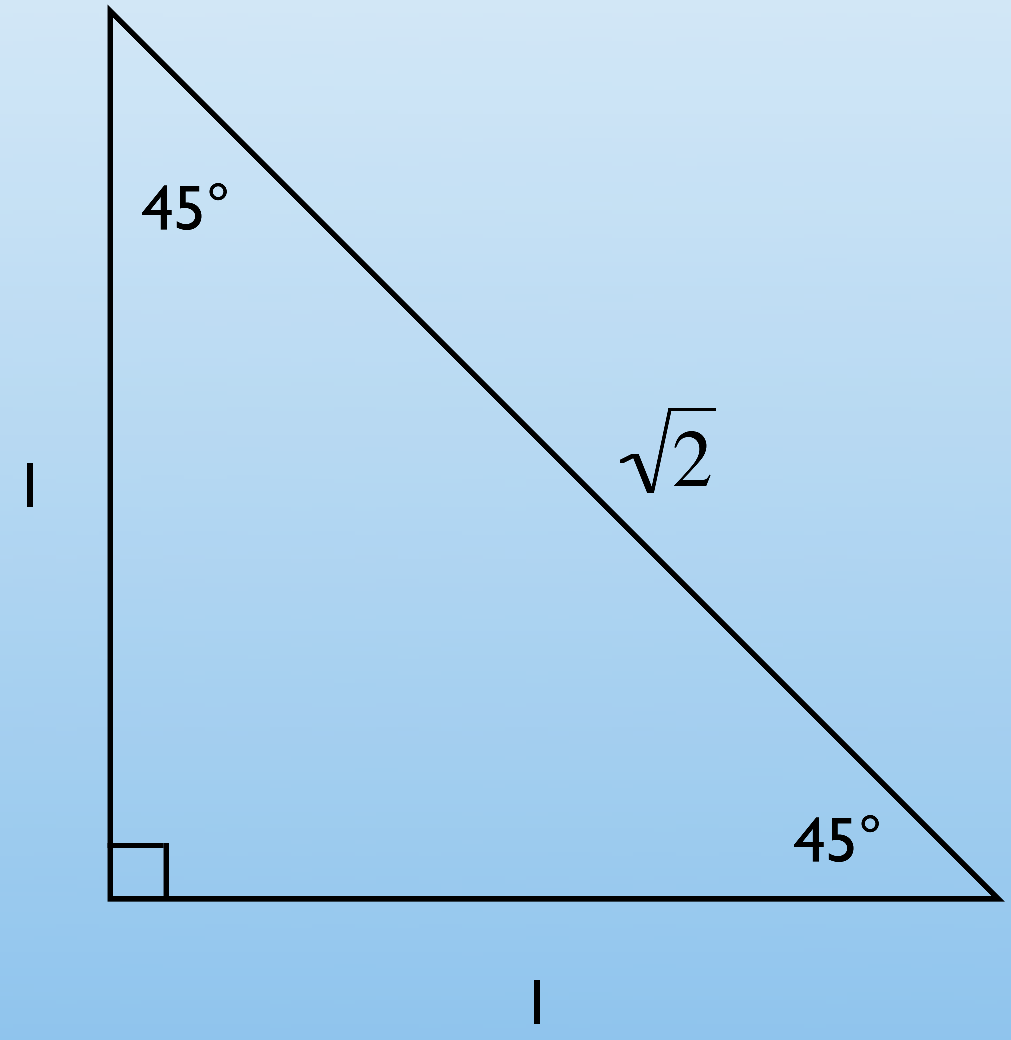

30°
36
$18\sqrt{3}$
60°
18

## 2. 45 - 45 - 90


45°
$3\sqrt{2}$
3
45°
3

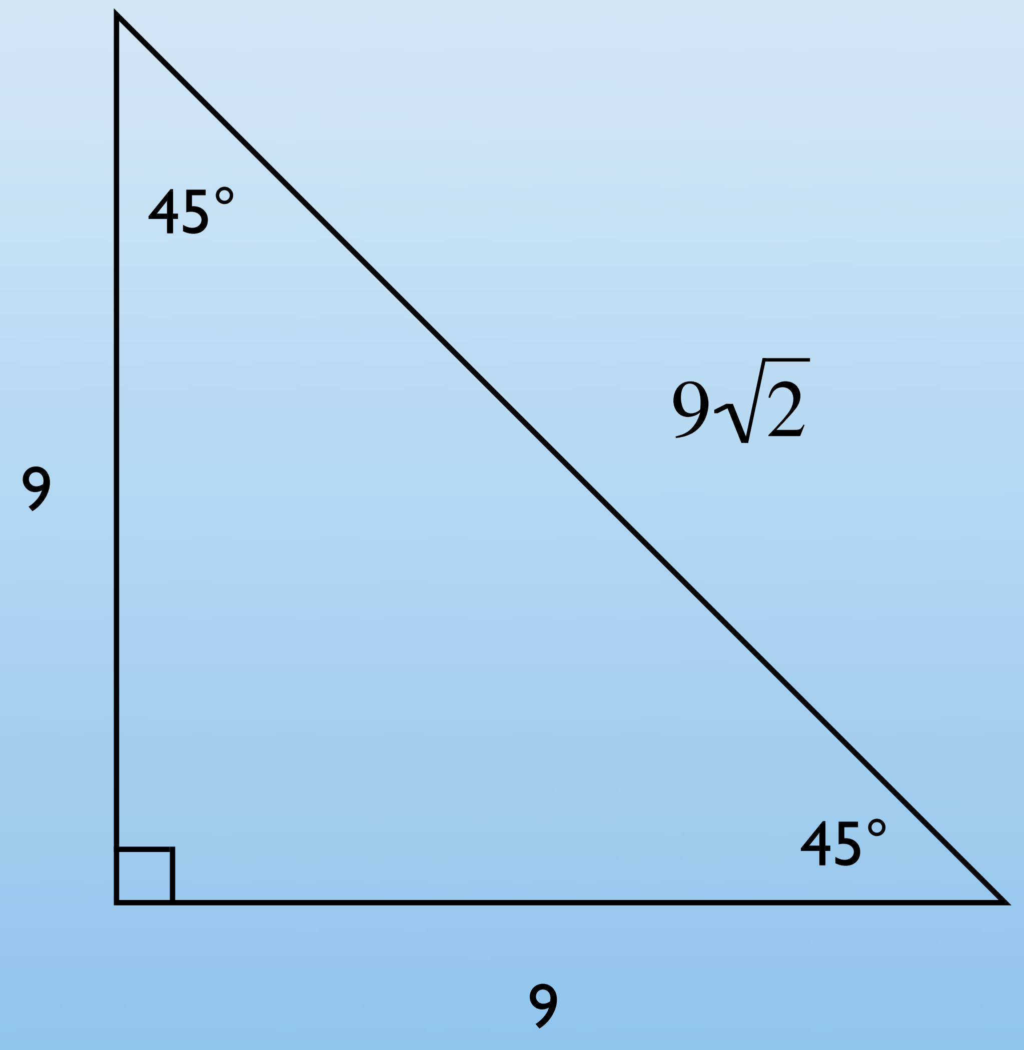
The 45-45-90 is one half a square.

# 2. 45 - 45 - 90


45°
1
$\sqrt{2}$
45°
1

Again we’re Pythagorizing, but looking for a rule, a pattern.

## 2. 45 - 45 - 90


45°
$9\sqrt{2}$
9
45°
9

## 3. Classwork

pg. 477 // #1 - 9, 11
pg. 470 // #1 - 8
pg. 474 // Visual Learning #1 - 2

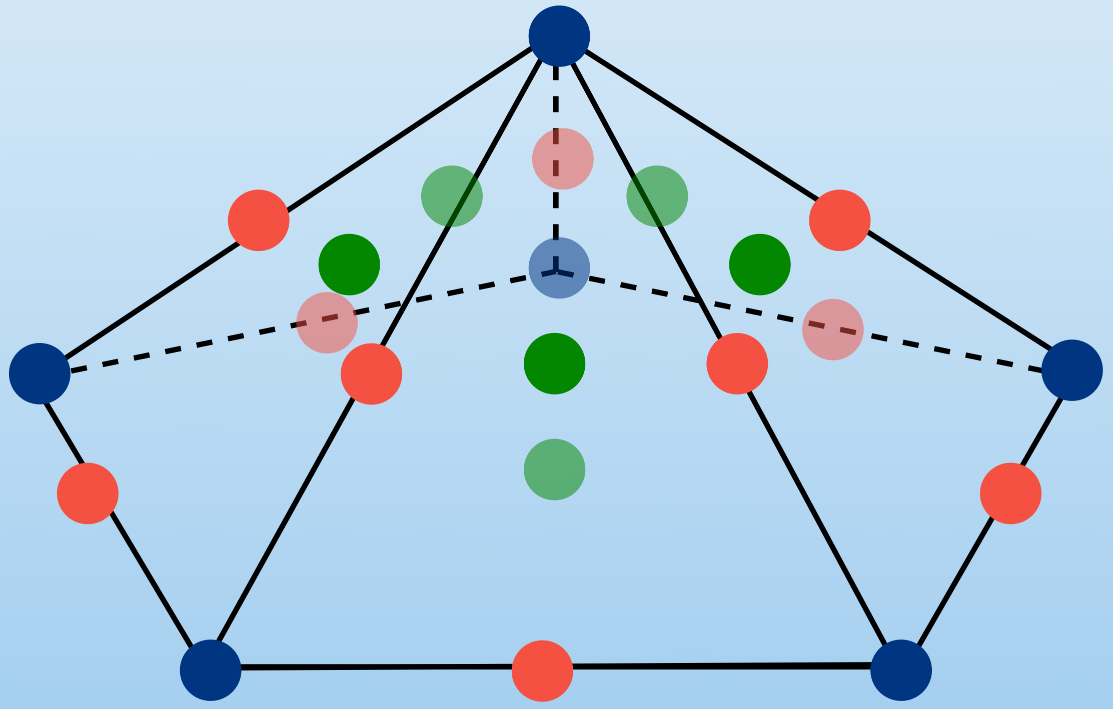
## 4. Break

## 5. Show and Tell

A student here said it was useful for him to draw the enclosing equilateral triangle.

# 6. Notes - Polyhedrons

Three dimensional shapes made up of polygons.



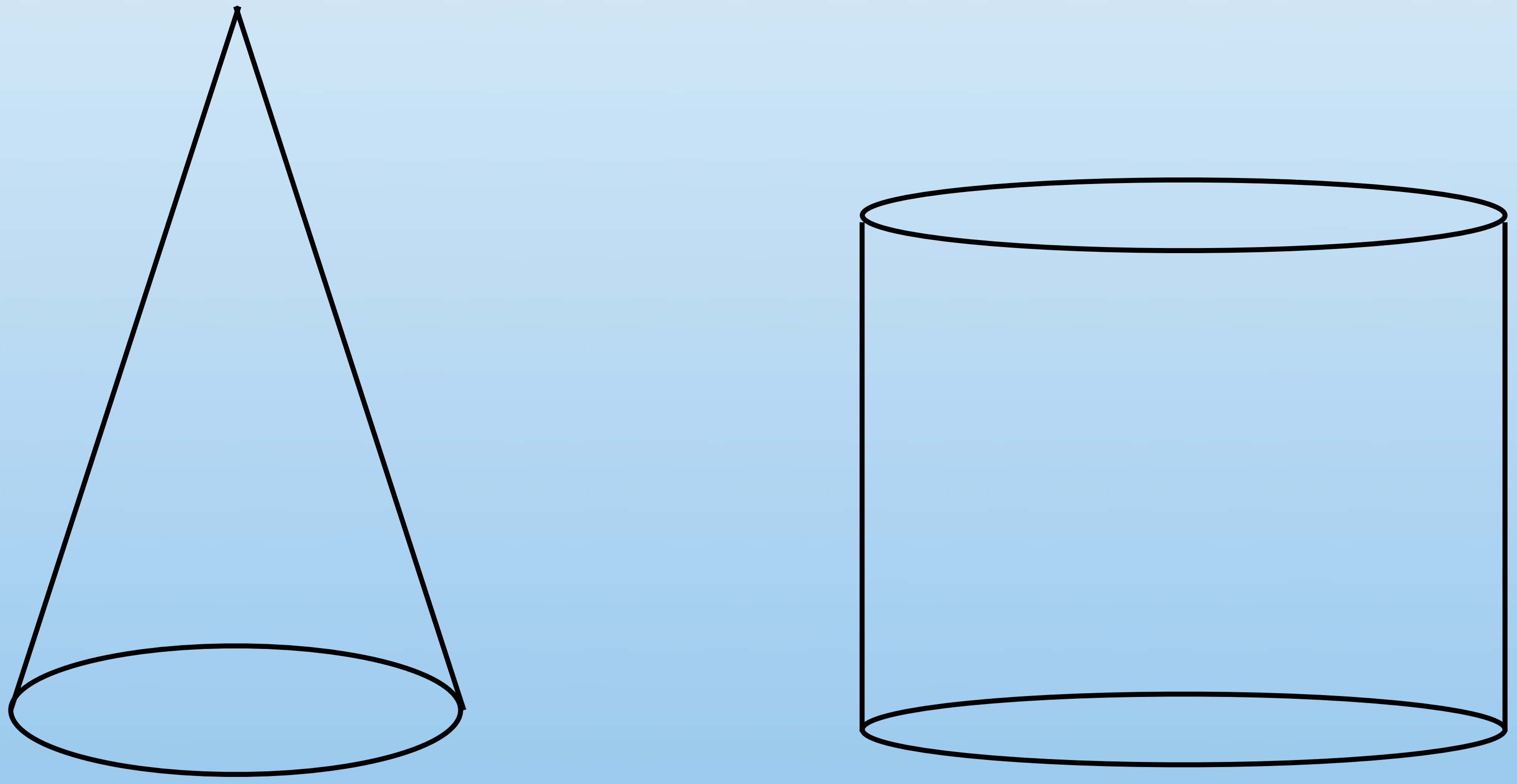
vertices

edges

faces

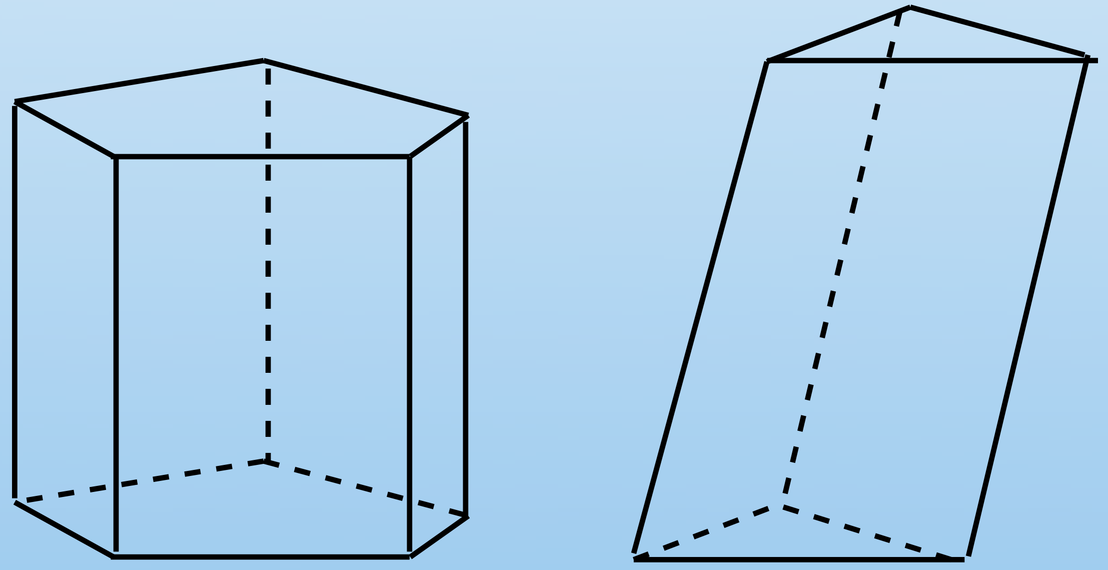
This is not a pentahedron.  This is a hexahedron.  Number of sides.

# 6. Notes - Not Polyhedrons



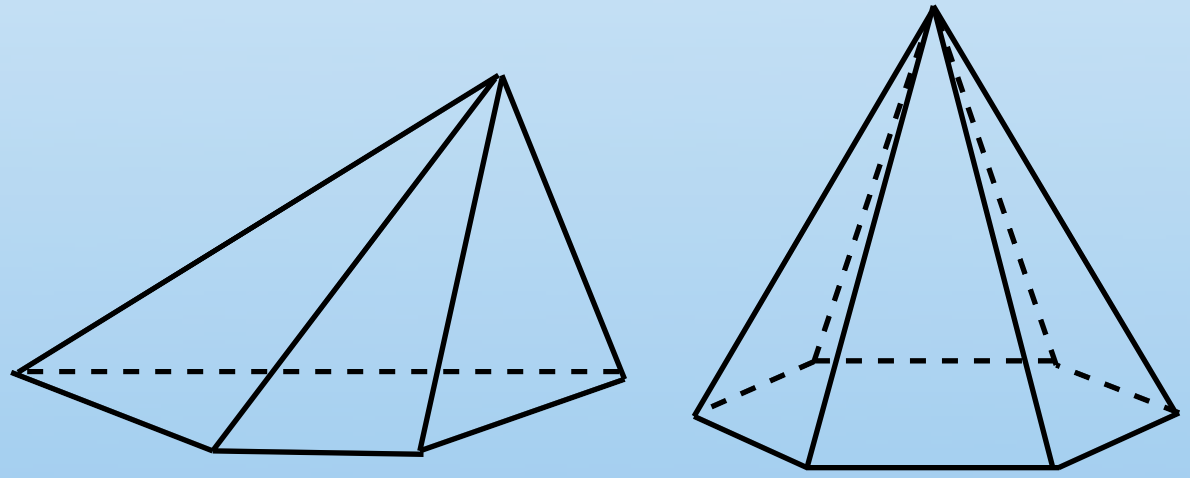
# 6. Notes - Two Kinds of Polyhedrons

Prisms



Two congruent, parallel bases.

Pyramids



One base and one vertex.

Talk about lateral faces.  Lateral edges.  Oblique.

# 6. Notes - Prism

1. Name all the bases of the prism.

   PQR & TUS

2. Name all the lateral faces of the prism.

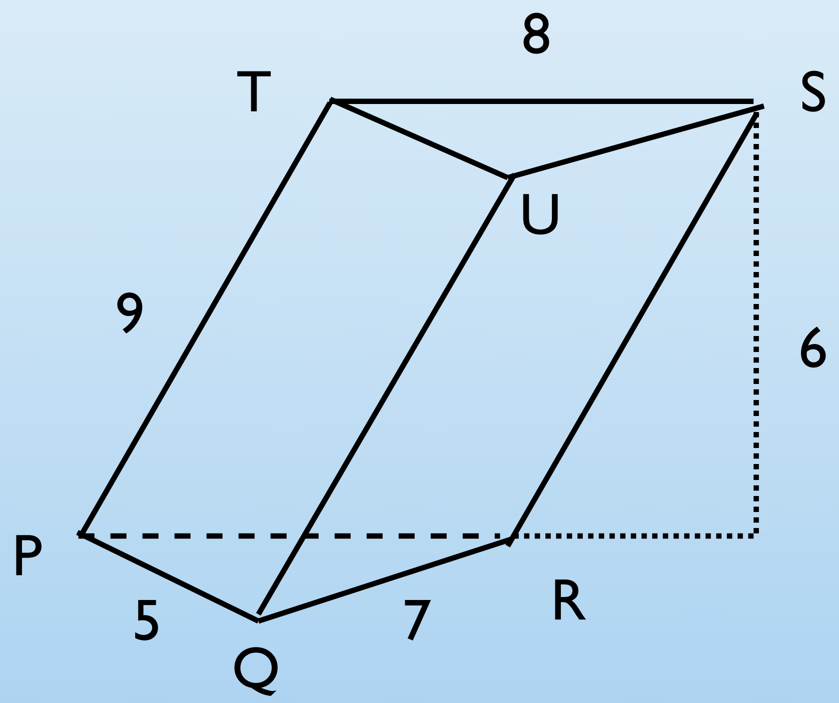
   PTUQ & QUSR & PTSR

3. Name all the lateral edges of the prism.

   PT & QU & RS

4. What is the height of the prism?

   6



# 6. Notes - Pyramid

5. Name the base of the pyramid.

   GNATPY

6. Name the vertex of the pyramid.

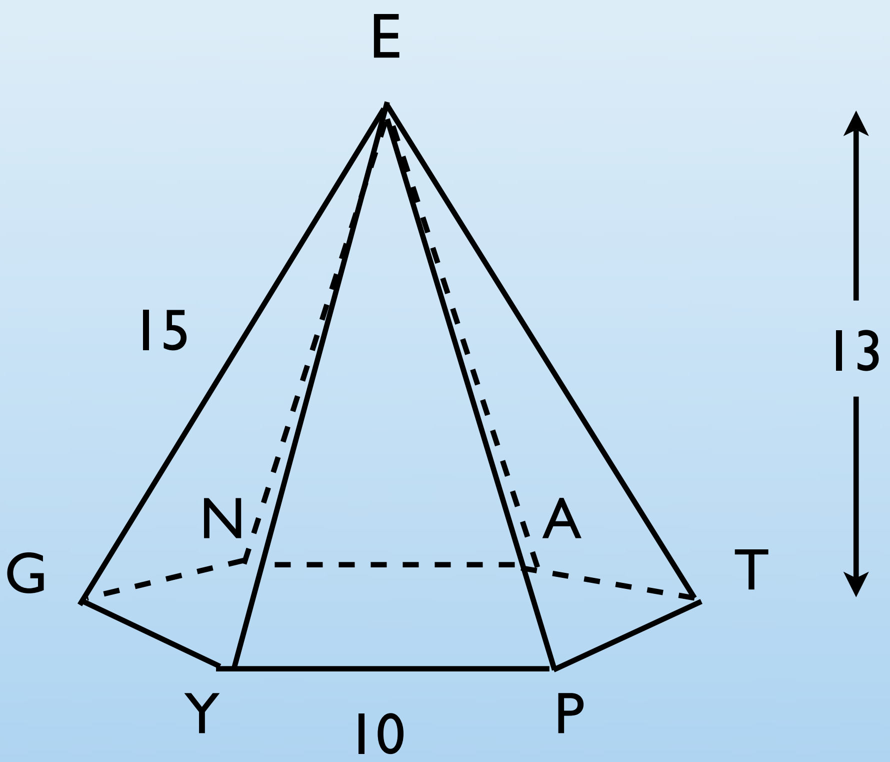
   E

7. Name all the lateral edges of the pyramid.

   EG & EN & EA &
   ET & EP & EY

8. What is the height of the pyramid?

   13



# 6. Notes - Prism

Identify the solids.

C 9. Die
F 10. Tomb of E
H 11. Wedge or
J 12. Box of bre
M 13. Plastic bo
I 14. Ingot of si
L 15. Honeycom
G 16. Stop sign
E 17. Moon
A 18. Can of tun
J 19. Book
H 20. Pup tent.

A. Cylinder
one
quare prism
quare pyramid
phere
riangular pyramid
ctagonal prism
riangular prism
rapezoidal prism
ectangular prism
K. Heptagonal pyramid
L. Hexagonal prism
M. Hemisphere

Ask them to sort things into pyramid & prism categories. This here’s a picture of an ingot.

# 7. Classwork

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27. T
28. F, it is only true for some pyramids
29. T
30. T
31. F, it is a sector.
32. T
33. F, the segment has to be perpendicular.
34. T
35. T