MATH 7 Accelerated:
Week of June 1

- Go through the slides (notes) and work through the examples on a separate piece of paper.
- Do the given practice problems (again, on a separate piece of paper).
- Check your answers with the key given (last slide).
- Take a photo or scan in your work and submit it in Google Classroom. If you have questions or would like feedback on your work, add that as a comment with your submitted work.
- The other option for turn in is to send it in on Monday when the new packet is available.
- Zoom help session invites will be sent to your school email address.

Day 1: Slides 2-8 | Day 2: Slides 9-11
Day 3: Slides 12-17 | Answers on Slide 18

Day 1: L18

Applying the Pythagorean Theorem

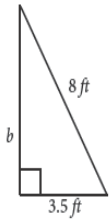
Target: Apply the Pythagorean Theorem to solve problems in two and three dimensions.

Solving Application Problems

1. Draw a diagram to represent the situation.
2. Label the diagram with the given measures.
3. Solve for the missing measure. Label the answer.

Example 1

An 8 foot ladder is placed 3.5 feet from the base of a wall. How high up the wall will the ladder reach? Round to the nearest tenth.



Draw a diagram.

Substitute known values into the Pythagorean Theorem. $3.5^2 + b^2 = 8^2$

Simplify by squaring. $12.25 + b^2 = 64$

Subtract 12.25 from both sides. $-12.25 \quad -12.25$

$b^2 = 51.75$

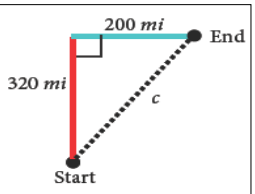
Square root both sides. $\sqrt{b^2} = \sqrt{51.75}$

$b = 7.2$

The ladder will reach approximately 7.2 feet up the wall.

Example 2

A ship travels 320 miles due north and then makes a turn due east. It travels 200 miles east. How far is the ship from its starting point? Round to the nearest mile.



Use the Pythagorean Theorem. $320^2 + 200^2 = c^2$

Simplify by squaring. $102400 + 40000 = c^2$

Add. $142400 = c^2$

Square root both sides. $\sqrt{142400} = \sqrt{c^2}$

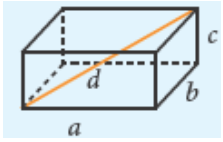
Round to the nearest whole number. $377 \text{ miles} \approx c$

The ship is approximately 377 miles from its starting point.

The Pythagorean Theorem in Three Dimensions

- In a rectangular prism, the length of the longest diagonal d squared is equal to the sum of the squares of the length a, the width b and the height c of the prism.

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



Example 3

What is the longest object that Simone can put in a rectangular box that is 10 inches wide, 12 inches long and 20 inches tall? Round to the nearest tenth of an inch.

Write the three-dimensional formula. $a^2 + b^2 + c^2 = d^2$

Substitute known values. $10^2 + 12^2 + 20^2 = d^2$

Simplify by squaring. $100 + 144 + 400 = d^2$

Add. $644 = d^2$

Square root both sides. $\sqrt{644} = \sqrt{d^2}$

Round to nearest tenth. $25.4 \text{ inches} \approx d$

The longest object that can fit in the box is about 25.4 inches.

L18 Practice Problems:

1. A car travels 60 miles due north then makes a turn due west. It travels 72 miles west. How far is the car from its starting point?

2. Michelle delivers books to school libraries. Her truck has a slide out ramp for unloading the books. The top of the ramp is 3 feet above the ground. The ramp itself is 5.2 feet long. What is the horizontal distance the ramp reaches?

3. Pete has a 15-foot ladder. The safety instructions recommend he should have the base of the ladder 6 feet from the base of the wall he will lean the ladder against. How high will the ladder reach on the wall?

L18 Practice Problems:

4. A local businessman bought a square plot of land. The sides of the lot measure 32 feet on each side. He decides to split the lot into two equal-sized right triangles by putting a fence down the diagonal. Approximately how many feet of fencing will he need?

5. A rectangular prism is 5 inches long, 8 inches wide and 10 inches tall. What is the length of its longest diagonal?

6. Chris is mailing his friend a poster that has been rolled up in a long tube. He has a box that measures 20 inches by 8 inches by 4 inches. What is the maximum length the rolled poster can be?

END DAY 1

Day 2: L19

Distance on the Coordinate Plane

Target: Find the distance between two points on the coordinate plane using the Pythagorean Theorem.

1. Graph the two ordered pairs. Connect the points and label the segment *c*.
2. Using *c* as the hypotenuse of a right triangle, draw the legs of the triangle.
3. Find the lengths of the legs.
4. Use the Pythagorean Theorem to find the length of the hypotenuse *c*. This length is the distance between the two points on the coordinate plane.

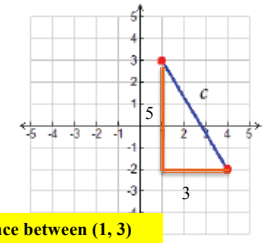
Example 1

Find the distance between (1, 3) and (4, –2). Round to the nearest tenth.

First, graph the points. Connect with line segment *c*. Draw a right triangle with *c* as the hypotenuse. The legs are 3 and 5.

Use the Pythagorean Theorem:

$$3^2 + 5^2 = c^2$$
$$9 + 25 = c^2$$
$$34 = c^2$$
$$\sqrt{34} = \sqrt{c^2}$$
$$5.8 \approx c$$

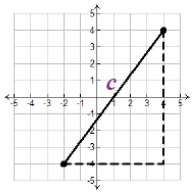


The distance between (1, 3) and (4, –2) is about 5.8 units.

L19 Practice Problems:

Find the length of *c* on each graph. When necessary, round to the nearest tenth.

1.



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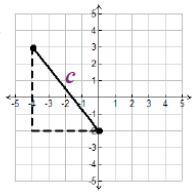


Graph the following points, then find the distance between each set of points. If necessary, round to the nearest tenth.

3. (1, −2) and (4, 2)

4. (0, 5) and (−3, 0)

5. (−2, −3) and (3, 4)

6. (1, 4) and (3, 3)

7. (0, 0) and (5, −2)

8. (4, 2.5) and (1, 0)

END DAY 2

Day 3: L20

The Distance Formula

Target: Find the distance between two points on a coordinate plane using the Distance Formula.

Vocabulary

Distance Formula: The formula that allows you to find the distance between any two points on a coordinate plane without graphing first.

The distance, *d*, between two points (x_1, y_1) and (x_2, y_2) is found by:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Example 1

Find the distance between (1, 2) and (4, 6).

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$
$$d = \sqrt{(4-1)^2 + (6-2)^2}$$
$$d = \sqrt{(3)^2 + (4)^2}$$
$$d = \sqrt{9+16}$$
$$d = \sqrt{25}$$
$$d = 5$$

The distance between (1, 2) and (4, 6) is 5 units.

Example 2

Find the distance between (0, 8) and (3, 2). Round to the nearest tenth.

Write the distance formula. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Substitute the ordered pairs. $d = \sqrt{(3-0)^2 + (2-8)^2}$

Simplify the parentheses. $d = \sqrt{(3)^2 + (-6)^2}$

Simplify by squaring. $d = \sqrt{9+36}$

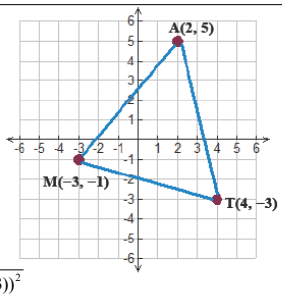
Add. $d = \sqrt{45}$

Square root and round. $d \approx 6.7$

The distance between (0, 8) and (3, 2) is about 6.7 units.

Example 3

Find the perimeter of ΔMAT to the nearest tenth.



$\overline{AM} = \sqrt{(-3-2)^2 + (-1-5)^2}$

$\overline{AM} = \sqrt{(-5)^2 + (-6)^2}$

$\overline{AM} = \sqrt{25+36}$

$\overline{AM} = \sqrt{61}$

$\overline{AM} \approx 7.8$

$\overline{TA} = \sqrt{(2-4)^2 + (5-(-3))^2}$

$\overline{TA} = \sqrt{(-2)^2 + (8)^2}$

$\overline{TA} = \sqrt{4+64}$

$\overline{TA} = \sqrt{68}$

$\overline{TA} \approx 8.2$

$\overline{MT} = \sqrt{(4-(-3))^2 + (-3-(-1))^2}$

$\overline{MT} = \sqrt{(7)^2 + (-2)^2}$

$\overline{MT} = \sqrt{49+4}$

$\overline{MT} = \sqrt{53}$

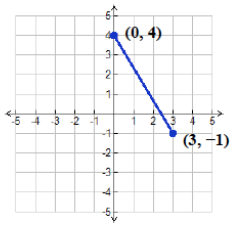
$\overline{MT} \approx 7.3$

$$Perimeter = 7.8 + 8.2 + 7.3 = 23.3$$

L20 Practice Problems:

Use the distance formula to calculate the length of each segment. Round to the nearest tenth.

1.



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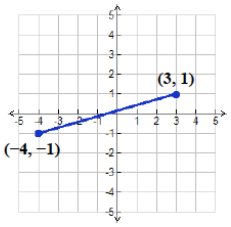

Use the distance formula to find the distance between each pair of points. If necessary, round to the nearest tenth. DO NOT GRAPH.

3. (2, 2) and (8, 10)
4. (3, 9) and (−1, 10)
5. (−7, 6) and (0, 5)
6. (17, −6) and (2, 1)
7. (0, −9) and (−2, 3)
8. (0, 1.5) and (3, 12)

L20 Practice Problems:

9. ΔABC is formed by the points A(−4, 5), B(3, 2) and C(1, −1).

a. Find the length of $\overline{AB}$. Round to the nearest tenth.

b. Find the length of $\overline{BC}$. Round to the nearest tenth.

c. Find the length of $\overline{CA}$. Round to the nearest tenth.

d. Find the approximate perimeter of the triangle.

END DAY 3

ANSWER PAGE

Reminder: ALL work must be shown for EVERY problem!

Day 1:
1. 93.7 miles
2. 4.2 feet
3. 13.7 feet
4. 45.3 feet
5. 13.7 feet
6. 21.9 inches

Day 2:
1. $c = 10$
2. $c \approx 6.4$
3. $c = 5$
4. $c \approx 5.8$
5. $c \approx 8.6$
6. $c \approx 2.2$
7. $c \approx 5.4$
8. $c \approx 3.9$

Day 3:
1. $d \approx 5.8$
2. $d \approx 7.3$
3. $d = 10$
4. $d \approx 4.1$
5. $d \approx 7.1$
6. $d \approx 16.6$
7. $d \approx 12.2$
8. $D \approx 10.9$
9. a. 7.6 b. 3.6 c. 7.8 d. 19 units

MATH 7A: LAST SLIDE!