

Day 6 - Similarity

- One large figure, one smaller
- Set up a proportion and solve

Examples

2 boxes are similar in dimension. The first is 4 x 5 and the second is 12 x ?

Your Turn - Solve

One tree is 4 feet tall and has a shadow that is 3.2 feet long. The second has a shadow that is 8.4 feet long, how tall is it?

Money

- Regular Income = Hours x Rate (for 1st 40 hours)
- Overtime Income = 1.5 x OT Hours x Rate (for hours over 40)

Examples

Sam works for \$5.50 per hour. What is his income if he works 35 hours?

How many hours does he have to work to make \$200?

Jack works for \$8 per hour. What is his income if he works 50 hours?

Your Turn

Sam works for \$7.50 per hour. What is his income if he works 15 hours?

How many hours does he have to work to make \$200?

Jack works for \$10 per hour. What is his income if he works 52 hours?

OGT Preparation #6

Name _____

ME07 – Similarity and Indirect Measurement & ME09 – Money, Time, Rate, Distance

1. Alanis is moving and needs to pack two mirrors. The larger mirror fits in a box that is 18 inches wide by 20 inches long. Her smaller mirror is similar in proportion to the larger mirror. Alanis determines that the width of the smaller box needs to be a minimum of 9 inches. What should be the minimum length of the box to hold the smaller mirror?

- A. 2 inches B. 6 inches C. 9 inches D. 10 inches

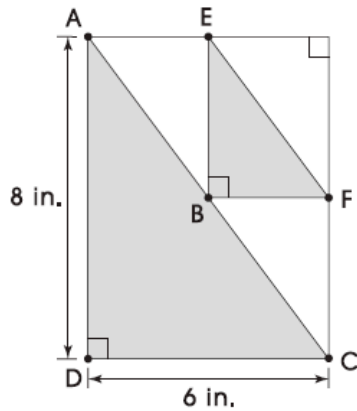
2. Janice had a 5-inch high by 3-inch wide photo enlarged to a 3.5-foot tall poster. What should be the approximate width of the poster?

- A. 1.5 feet B. 2.1 feet C. 4.5 feet D. 5.8 feet

3. Alicia is 5 feet tall. She casts a shadow that measures $6\frac{1}{2}$ feet long at the same time that a sculpture in the park casts a shadow 12 feet long. Which of the following is the approximate height of the sculpture?

- A. 9 feet B. 16 feet C. 27 feet D. 78 feet

4. Jennifer is designing a quilt. The pattern for one part is shown in the rectangle.



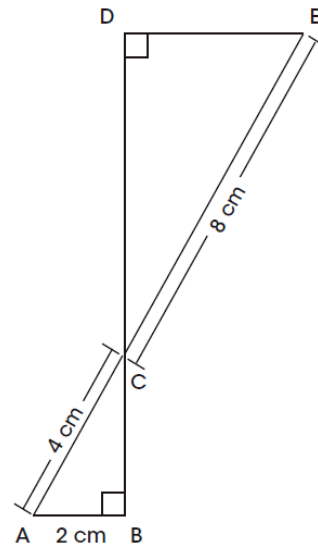
Triangles ADC and EBF are similar. $\overline{AB} = \overline{BC}$.

What is the length of \overline{EF} ?

- A. 5 in.
B. 6 in.
C. 10 in.
D. 12 in.

5.

\overline{ED} and \overline{AB} are both perpendicular to \overline{BD} . In triangle ABC, the length of \overline{AC} is 4 cm and the length of \overline{AB} is 2 cm.



If the length of \overline{EC} is 8 cm, what is the length of \overline{ED} ?

- A. 4 cm
B. $4\sqrt{2}$ cm
C. $8\sqrt{2}$ cm
D. 16 cm

PART 2

6. [SA] Ernesco earns \$9.00 an hour at his summer job. His employer must pay him “time and a half” ($1\frac{1}{2}$ times his regular hourly earnings) for each hour over 40 hours per week. His employer withholds 15% of his gross pay for various taxes. The table shows Ernesco’s work time for the week.

Ernesco’s Hours

Mon	Tue	Wed	Thu	Fri
$8\frac{3}{4}$ h	9h	$10\frac{1}{2}$ h	$11\frac{3}{4}$ h	$9\frac{1}{2}$ h

In your Answer Document, determine the amount of Ernesco’s pay check, after taxes are withheld, for the week shown in the table. Show your work or provide an explanation to support your answer.

7. Enrica took two days to drive 1,020 miles. On the first day, she drove 10 hours at an average speed of 62 miles per hour. On the second day, her average speed was 57 miles per hour. Approximately how long did she drive on the second day?

- A. 7.0 hours B. 8.6 hours C. 10.9 hours D. 17.0 hours

8. Federico is paid \$8.50 per hour for the first 40 hours he works each week. For each hour Federico works over 40 hours, he is paid for one-and-a-half hours. One week Federico works 48 hours. How much does Federico earn for working 48 hours in one week?

- A. \$340 B. \$408 C. \$442 D. \$612

9. Helga earns \$6.30 per hour working part-time at the grocery store. She records her starting and ending times each day on her time card.

Helga's Time Card

Date	In	Out
Monday 7/25	10:30 a.m.	2:00 p.m.
Tuesday 7/26	12:45 p.m.	3:30 p.m.
Wednesday 7/27		
Thursday 7/28	12:00 p.m.	4:45 p.m.
Friday 7/29	11:15 a.m.	3:45 p.m.

In your **Answer Document**, determine Helga's total wages for the week. Show your work or provide an explanation for your answer.

10. Before her trip to Canada, Liz exchanged 300 U.S. dollars for Canadian dollars at a rate of 1 U.S. dollar to 1.35 Canadian dollars. When Liz arrived in Canada, the exchange rate was 1 Canadian dollar to 0.76 U.S. dollars.

In your **Answer Document**:

- Determine the amount of money in Canadian dollars that Liz received for her 300 U.S. dollars.
- Determine whether Liz would have received more Canadian money for her 300 U.S. dollars if she had waited to exchange her money in Canada.

Show your work or provide an explanation for your answers.

1. Alanis is moving and needs to pack two mirrors. The larger mirror fits in a box that is 18 inches wide by 20 inches long. Her smaller mirror is similar in proportion to the larger mirror. Alanis determines that the width of the smaller box needs to be a minimum of 9 inches. What should be the minimum length of the box to hold the smaller mirror?

- A. 2 inches B. 6 inches C. 9 inches **D. 10 inches**

$$\frac{18}{20} = \frac{9}{x}$$

2. Janice had a 5-inch high by 3-inch wide photo enlarged to a 3.5-foot tall poster. What should be the approximate width of the poster?

- A. 1.5 feet **B. 2.1 feet** C. 4.5 feet D. 5.8 feet

$$\frac{5}{3} = \frac{3.5}{x}$$

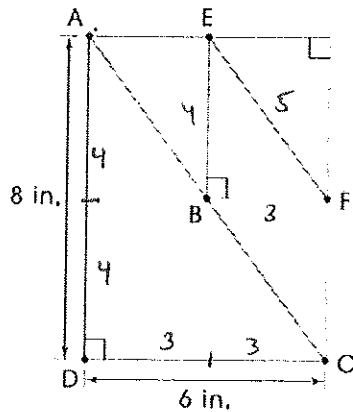
$$2.1$$

3. Alicia is 5 feet tall. She casts a shadow that measures 6½ feet long at the same time that a sculpture in the park casts a shadow 12 feet long. Which of the following is the approximate height of the sculpture?

- A. 9 feet** B. 16 feet C. 27 feet D. 78 feet

$$\frac{5}{6.5} = \frac{x}{12}$$

4. Jennifer is designing a quilt. The pattern for one part is shown in the rectangle.



Triangles ADC and EBF are similar. $\overline{AB} = \overline{BC}$.

What is the length of \overline{EF} ?

- A. 5 in.**
B. 6 in.
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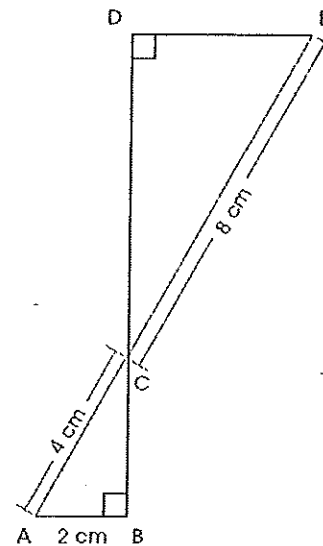
$$3^2 + 4^2 = x^2$$

$$25 = x^2$$

$$5 = x$$

5.

\overline{ED} and \overline{AB} are both perpendicular to \overline{BD} . In triangle ABC, the length of \overline{AC} is 4 cm and the length of \overline{AB} is 2 cm.



$$\frac{4}{2} = \frac{8}{x}$$

If the length of \overline{EC} is 8 cm, what is the length of \overline{ED} ?

- A. 4 cm**
B. $4\sqrt{2}$ cm
C. $8\sqrt{2}$ cm
D. 16 cm

PART 2

6. [SA] Ernesco earns \$9.00 an hour at his summer job. His employer must pay him "time and a half" ($1\frac{1}{2}$ times his regular hourly earnings) for each hour over 40 hours per week. His employer withholds 15% of his gross pay for various taxes. The table shows Ernesco's work time for the week.

Ernesco's Hours

Mon	Tue	Wed	Thu	Fri
$8\frac{3}{4}$ h	9h	$10\frac{1}{2}$ h	$11\frac{3}{4}$ h	$9\frac{1}{2}$ h

total
49 $\frac{1}{2}$

In your Answer Document, determine the amount of Ernesco's pay check, after taxes are withheld, for the week shown in the table. Show your work or provide an explanation to support your answer.

Reg Pay
 $40 \cdot 9 = 360$

Overtime Pay
 $9\frac{1}{2}(1\frac{1}{2})9 = 128.25$

total 15%
488.25 $.15(488.25) = 73.24$

$488.25 - 73.24 = 415.01$

7. Enrica took two days to drive 1,020 miles. On the first day, she drove 10 hours at an average speed of 62 miles per hour. On the second day, her average speed was 57 miles per hour. Approximately how long did she drive on the second day?

- (A) 7.0 hours B. 8.6 hours C. 10.9 hours D. 17.0 hours

Day 1: $D = RT$
 $D = 62(10) = 620$

$\frac{1020}{-620}$
400

Day 2: $D = RT$
 $400 = 57T$ $T = 7$

8. Federico is paid \$8.50 per hour for the first 40 hours he works each week. For each hour Federico works over 40 hours, he is paid for one-and-a-half hours. One week Federico works 48 hours. How much does Federico earn for working 48 hours in one week?

- A. \$340 B. \$408 (C) \$442 D. \$612

Reg. Pay
 $40 \cdot 8.5 = 340$

Overtime
 $8(8.5)(1.5) = 102$

total
\$442

9. Helga earns \$6.30 per hour working part-time at the grocery store. She records her starting and ending times each day on her time card.

Helga's Time Card

Date	In	Out
Monday 7/25	10:30 a.m.	2:00 p.m.
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time before noon time after noon (+/-)

~~1.5~~ + 2 = 3.5

0 + 2 ³/₄ = 2.75

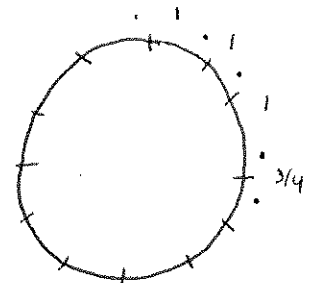
0 + 4 ³/₄ = 4.75

³/₄ + 3 ³/₄ = 4.5

15.5

In your Answer Document, determine Helga's total wages for the week. Show your work or provide an explanation for your answer.

$$15.5(6.3) = 97.65$$



10. Before her trip to Canada, Liz exchanged 300 U.S. dollars for Canadian dollars at a rate of 1 U.S. dollar to 1.35 Canadian dollars. When Liz arrived in Canada, the exchange rate was 1 Canadian dollar to 0.76 U.S. dollars.

In your Answer Document:

- Determine the amount of money in Canadian dollars that Liz received for her 300 U.S. dollars.
- Determine whether Liz would have received more Canadian money for her 300 U.S. dollars if she had waited to exchange her money in Canada.

Show your work or provide an explanation for your answers.

$$\textcircled{1} \quad \frac{\text{US}}{300} = \frac{\text{Can}}{x}$$

405

$$\textcircled{2} \quad \frac{\text{US}}{300} = \frac{\text{Can}}{x}$$

395

NO