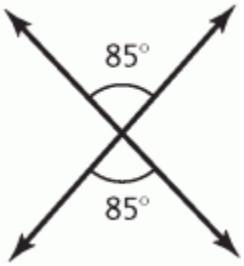
Pg 506-507 #11-13, 15, 17, 18, 21-24 AND
Pg 512-513 # 3-5, 12-15, 19, 20, 25, 27

11. vertical; 25

12. adjacent; 15

13. adjacent; 20

15.



17.

18. 43

21. never

22. always

23. sometimes

24. always

3. sometimes; Either x or y may be obtuse.

4. always; $90° + 90° = 180°$

5. never; Because x and y must both be less than 90° and greater than 0°.

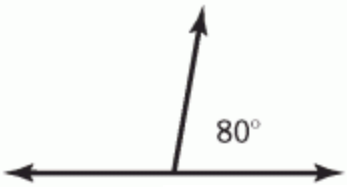
12. complementary; 15

13. complementary; 55

14. supplementary; 31

15. $\angle 1 = 130°$, $\angle 2 = 50°$, $\angle 3 = 130°$

19.



20.

25. $54°$

27. $x = 10; y = 20$

Name_____ Date_____

3.1 – Parallel Lines and Transversals

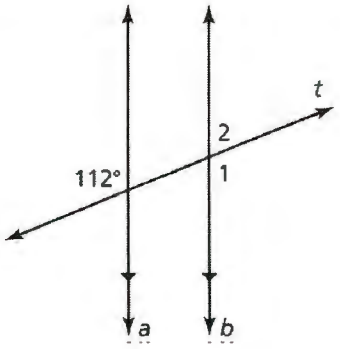
Use the figure to find the relationship between angles. Afterwards find the measure of the numbered angles.

1) 112° and ∠1 are alternate exterior angles.

2) ∠1 and ∠2 are supplementary angles.

3) $m\angle 1 = 112°$

4) $m\angle 2 = 68°$



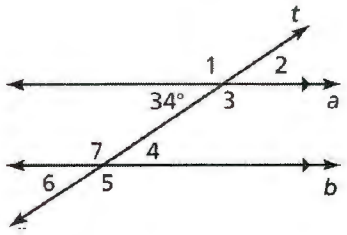
5) 34° and ∠2 are vertical angles.

6) ∠1 and ∠2 are supplementary angles.

7) ∠2 and ∠4 are corresponding angles.

8) ∠3 and ∠7 are alternate interior angles.

9) ∠1 and ∠5 are alternate exterior angles.



10) $m\angle 1 = 146°$

11) $m\angle 2 = 34°$

12) $m\angle 3 = 146°$

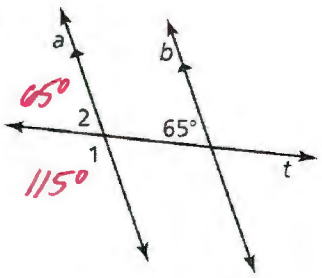
13) $m\angle 4 = 34°$

14) $m\angle 5 = 146°$

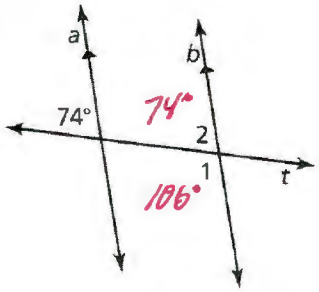
15) $m\angle 6 = 34°$

Use the figure to find the measures of the numbered angles.

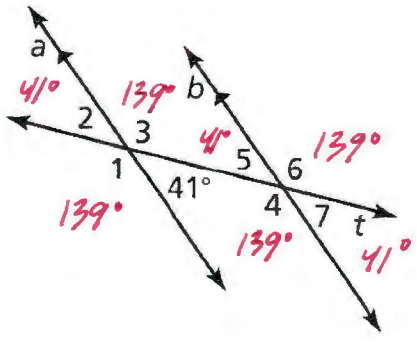
16)



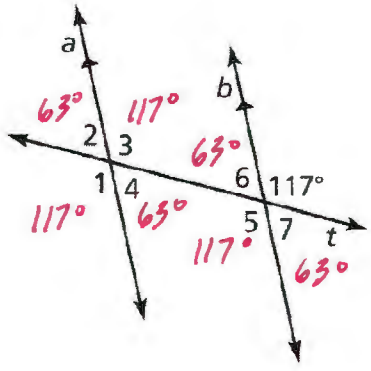
17)



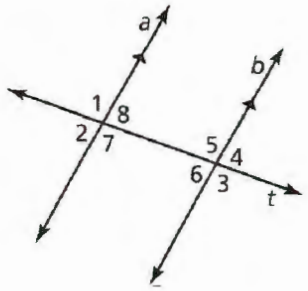
18)



19)



Complete the statement. Explain your reasoning.



20) If the measure of $\angle 1 = 160°$, then the measure of $\angle 5 =$ 160°.

Why? They are corresponding angles

21) If the measure of $\angle 6 = 37°$, then the measure of $\angle 4 =$ 37°.

Why? They are vertical angles

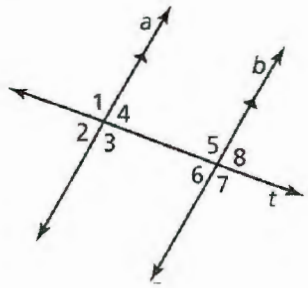
22) If the measure of $\angle 8 = 82°$, then the measure of $\angle 3 =$ 98°.

Why? ∠8 and ∠4 are congruent due to corresponding angles. ∠3 and ∠4 are supplementary. Thus ∠3 and ∠8 add up to 180°

23) If the measure of $\angle 4 = 60°$, then the measure of $\angle 5 =$ 120°.

Why? They are supplementary angles

Correct the following statements about the numbered angles by replacing the underlined words with the correct words.



24) $\angle 2$ is congruent to $\angle 4$. $\angle 4$ is congruent to $\angle 8$.

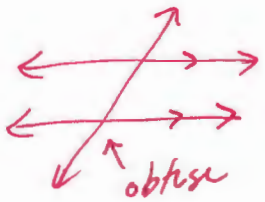
So, $\angle 2$ is supplementary to $\angle 8$.
congruent

supplementary

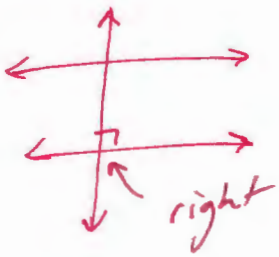
25) $\angle 6$ is congruent to $\angle 3$. $\angle 3$ is congruent to $\angle 1$.

So, $\angle 6$ is congruent to $\angle 1$.
supplementary

26) If a transversal intersects two parallel lines, is it possible for all of the angles formed to be acute angles? Explain.



no



no

Pg 518-519 #6-12, 27 AND
Pg 520-521 #1-17

6. right isosceles
7. equilateral equiangular
8. obtuse isosceles
9. right scalene
10. acute scalene
11. obtuse scalene
12. The triangle is not an acute triangle because acute triangles have 3 angles less than 90°. The triangle is an obtuse scalene triangle because it has one angle greater than 90° and no congruent sides.
27. a. green: 65; purple: 25; red: 45

    b. The angles opposite the congruent sides are congruent.

    c. An isosceles triangle has at least two angles that are congruent.

1. 91; obtuse scalene triangle
2. 75; acute scalene triangle
3. 90; right scalene triangle
4. 94; obtuse scalene triangle
5. 48; acute isosceles triangle
6. 60; equiangular equilateral triangle
7. yes
8. no; 39.5°

9. no; $28\frac{2}{3}$

10. yes

11. 67.5; acute isosceles triangle

12. 60; equiangular equilateral triangle

13. 24; obtuse isosceles triangle

14. 25; right scalene triangle

15. 35; obtuse scalene triangle

16. If two angle measures of a triangle were each greater than or equal to 90°, the sum of three angle measures would be greater than 180°, which is not possible.

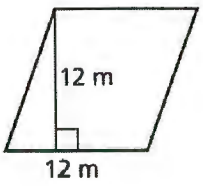
17. **a.** 72

b. You can change the distance between the bottoms of the two upright cards; yes; x must be greater than 60 and less than 90; If x were less than or equal to 60, the two upright cards would have to be exactly on the edges of the base card or off the base card. It is not possible to stack cards at these angles. If x where equal to 90, then the two upright cards would be vertical, which is not possible. The card structure would not be stable. In practice, the limits on x are probably closer to $70 < x < 80$.

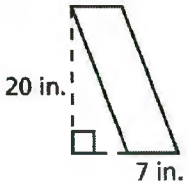
Name Answers Date

Geometry – Area of Polygons

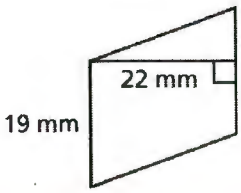
Find the area of each polygon. Show all necessary work.

1) 

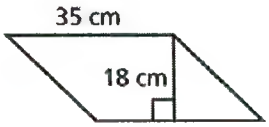
$A = bh$
$= 12 \times 12$
$= 144\ m^2$

2) 

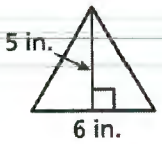
$A = bh$
$= 7 \times 20$
$= 140\ in^2$

3) 

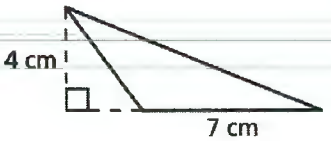
$A = bh$
$= 19 \times 22$
$= 418\ mm^2$

4) 

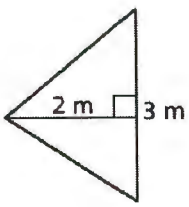
$A = bh$
$= 35 \times 18$
$= 630\ cm^2$

5) 

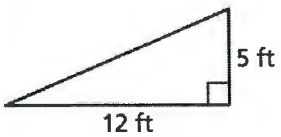
$A = \frac{1}{2}bh$
$= \frac{1}{2} \cdot 6 \cdot 5$
$= \frac{1}{2} \cdot 30$
$= 15\ in^2$

6) 

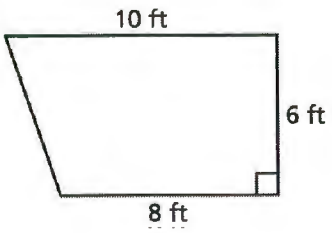
$A = \frac{1}{2}bh$
$= \frac{1}{2} \cdot 7 \cdot 4$
$= \frac{1}{2} \cdot 28$
$= 14\ cm^2$

7) 

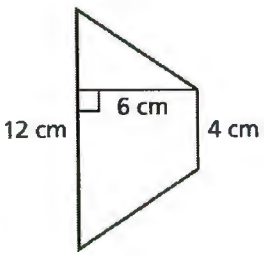
$A = \frac{1}{2}bh$
$= \frac{1}{2} \cdot 3 \cdot 2$
$= \frac{1}{2} \cdot 6$
$= 3\ m^2$

8) 

$A = \frac{1}{2}bh$
$= \frac{1}{2} \cdot 12 \cdot 5$
$= \frac{1}{2} \cdot 60$
$= 30\ ft^2$

9) 

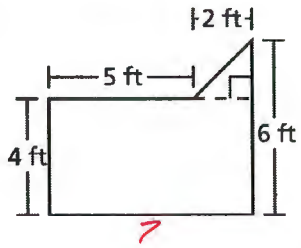
$A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(10 + 8)6$
$= \frac{1}{2}(18)6$
$= \frac{1}{2} \cdot 108$
$= 54\ ft^2$

10) 

$A = \frac{1}{2}(b_1 + b_2)h$
$= \frac{1}{2}(4 + 12)6$
$= \frac{1}{2}(16)6$
$= \frac{1}{2} \cdot 96$
$= 48\ cm^2$

Find the area of the figure. Show all work.

11)



$A = bh$ $\quad A = \frac{1}{2}bh$

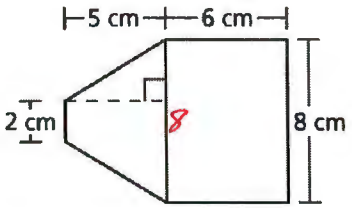
$= 7 \times 4$ $\quad = \frac{1}{2} \cdot 2 \cdot 2$

$= 28$ $\quad = 2$

Total Area $= 28 + 2$

$= 30 ft^2$

12)



$A = \frac{1}{2}(b_1 + b_2)h$ $\quad A = bh$

$= \frac{1}{2}(2+8)5$ $\quad = 8 \times 6$

$= \frac{1}{2}(10)5$ $\quad = 48$

$= \frac{1}{2} \cdot 50$

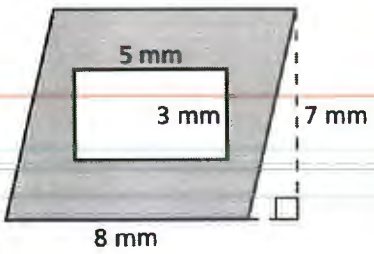
$= 25$

Total Area $= 25 + 48$

$= 73 cm^2$

Find the area of the shaded region.

13)



$A = bh$ $\quad A = bh$

$= 8 \times 7$ $\quad = 5 \times 3$

$= 56$ $\quad = 15$

shaded region $= 56 - 15$

$= 41 mm^2$

Complete the following.

14) The area of a parallelogram is 54 m^2. What is the measure of its base if the height of it is 6 m.

$A = bh$

$\frac{54}{6} = \frac{b \cdot 6}{6}$

$9 m = b$

15) The area of a triangle is 54 m^2. What is the measure of its base if the height of it is 6 m.

$A = \frac{1}{2}bh$

$54 = \frac{1}{2} \cdot b \cdot 6$

$\frac{54}{3} = \frac{3b}{3}$

$18 m^2 = b$

16) The area of a trapezoid is is 126 m^2. What is the measure of its height if the measures of its bases are 6m and 12 m.

$A = \frac{1}{2}(b_1 + b_2)h$

$126 = \frac{1}{2}(6+12)h$

$126 = \frac{1}{2}(18)h$

$\frac{126}{9} = \frac{9h}{9}$

$14\,m = h$

17) The area of a trapezoid is is 9 m^2 and its height is 3 m. If one of the bases has a measure of 2 m, what is the measure of the other base?

$A = \frac{1}{2}(b_1 + b_2)h$

~~$9 = \frac{1}{2}(2 + b_2)3$~~

$2 \cdot 9 = \frac{1}{2}(2+b_2)3 \cdot 2$

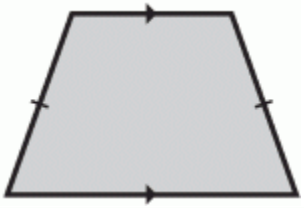
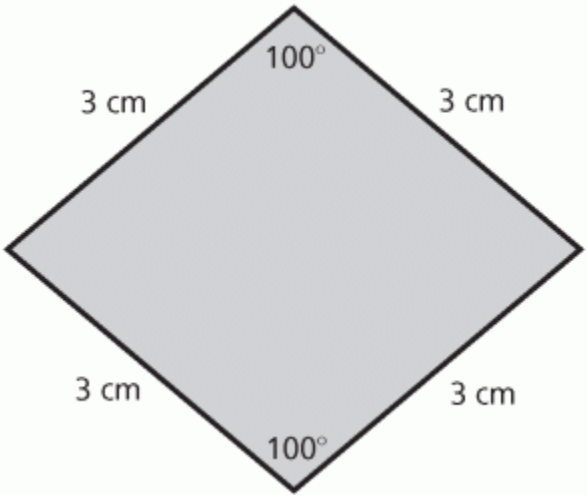
$\frac{18}{3} = \frac{(2+b_2)3}{3}$

$6 = 2 + b_2$

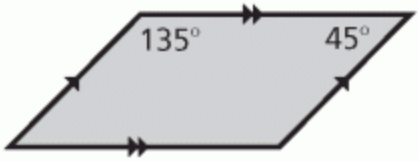
$-2 \quad -2$

$4 = b_2$ 4m

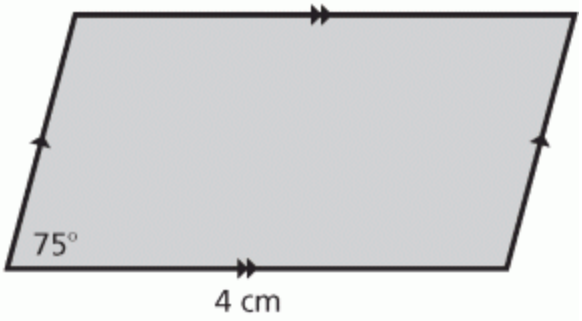
Pg 528-529 #1, 3-25 odd

1. all of them
3. kite; It is the only type of quadrilateral listed that does not have opposite sides that are parallel and congruent.
4. square
5. trapezoid
6. rhombus
7. kite
8. parallelogram
9. rectangle
10. 65
11. 110
12. 128
13. 58°
14. 
15. 

16.



17.



18. always

19. always

20. sometimes

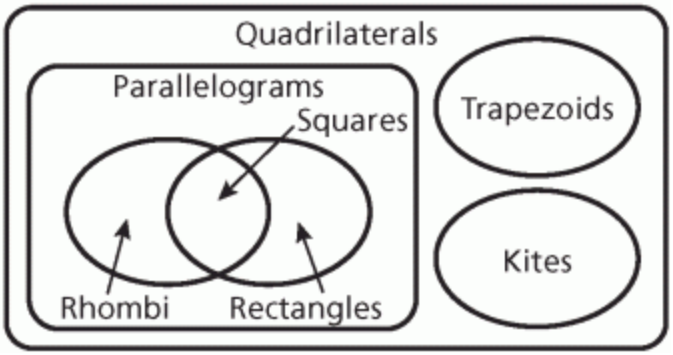
21. never

22. never

23. sometimes

24. See *Taking Math Deeper.*

25.



Pg 114-115 #4-9, 12-15, 23, 24

4. $30°, 60°, 90°$

5. $40°, 65°, 75°$

6. $35°, 45°, 100°$

7. $25°, 45°, 110°$

8. $44°, 48°, 88°$

9. $48°, 59°, 73°$

12. $128°$

13. $140°$

14. $108°$

15. The measure of the exterior angle is equal to the sum of the measures of the two nonadjacent interior angles. The sum of all three angles is not 180°;

$$(2x - 12) = x + 30$$
$$x = 42$$

The exterior angle is $(2(42) - 12)° = 72°$.

23. $x = -4$

24. $y = -1$

Pg 123-125 #5, 7, 10-11, 13, 16, 19, 24, 25, 28

5. 1260°

7. 360°

10. The right side of the formula is $(n - 2) \cdot 180°$, not $n \cdot 180°$.

$$\begin{aligned} S &= (n - 2) \cdot 180° \\ &= (13 - 2) \cdot 180° \\ &= 11 \cdot 180° \\ &= 1980° \end{aligned}$$

11. no; The interior angle measures given add up to 535°, but the sum of the interior angle measures of a pentagon is 540°.

13. 90°, 135°, 135°, 135°, 135°, 90°

16. 60°

19. The sum of the interior angle measures should have been divided by the number of angles, 20. $3240° \div 20 = 162°$; The measure of each interior angle is 162°.

24. 54°, 74°, 78°, 55°, 99°

25. 60°; The sum of the interior angle measures of a hexagon is 720°. Because it is regular, each angle has the same measure. So, each interior angle is $720° \div 6 = 120°$ and each exterior angle is 60°.

28. 125°, 125°, 55°, 55°

Pg 535-536 #1, 2, 8-17, 19, 30

1. A scale is the ratio that compares the measurements of the drawing or model with the actual measurements. A scale factor is a scale without any units.

2. larger; because 2 cm > 1 mm

8. 100 mi

9. 50 mi

10. 200 mi

11. 110 mi

12. 75 in.

13. 15 in.

14. 3.84 m

15. 21.6 yd

16. 17.5 mm

17. The 5 cm should be in the numerator.

$$\frac{1\text{ cm}}{20\text{ m}} = \frac{5\text{ cm}}{x\text{ m}}$$

$$x = 100\text{ m}$$

19. 2.4 cm; 1 cm : 10 mm

30. **a.** \$480

b. \$1536

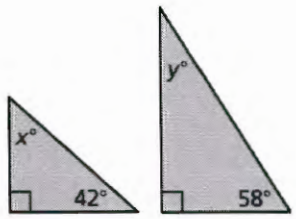
c. tile; Because \$5 per square foot is greater than \$2 per square foot, the tile has a higher unit cost.

Name_____ Date_____

3.4 – Using Similar Triangles

Tell whether the triangles are similar. Explain.

1)



$x+42+90=180$

$x+132=180$

$x=48°$

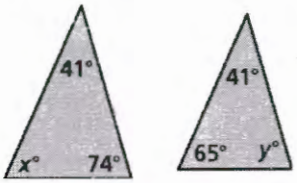
$y+58+90=180$

$y+148=180$

$y=32°$

No. Corresponding angles are not congruent.

2)



$x+74+41=180$

$x+115=180$

$-115\ \ -115$

$x=65°$

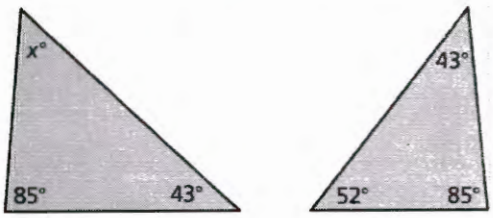
$y+65+41=180$

$y+106=180$

$y=74°$

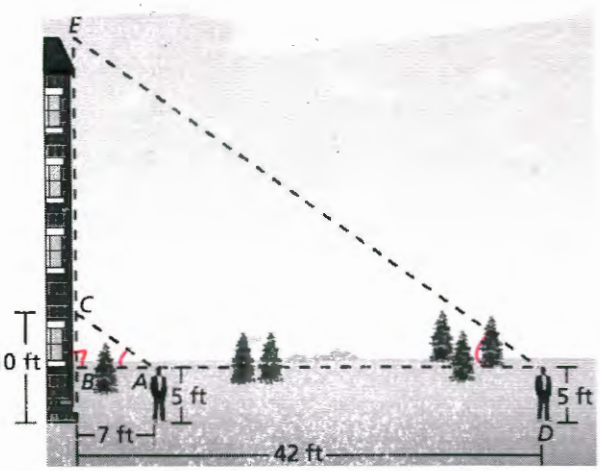
Yes. All angles are congruent.

3) The triangles are similar. Find the value of x.

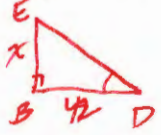


Due to the fact that there are two pair of angles congruent, the third angles must be congruent. Thus, $x=52°$.

4) You can use indirect measurement to estimate the height of a building. First measure your distance from the base of the building and the distance from the ground to a point on the building that you are looking at. Maintaining the same angle of sight, move back until the top of the building is in your line of sight.



a) Explain why $\triangle ABC$ and $\triangle DBE$ are similar.



Angles are congruent.

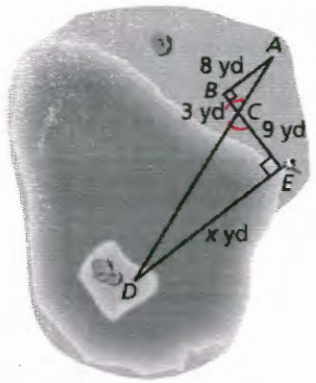
b) What is the height of the building?

$\frac{x}{5}=\frac{42}{7}$

$x=30$

$30+5=35\text{ ft}$

5) You and your friend are practicing for a rowing competition and want to know how far it is to an island in the Indian River Lagoon. You take measurements on your side of the lagoon and make the drawing shown.



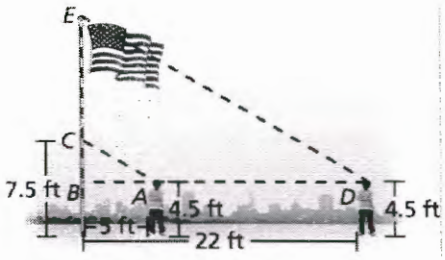
a) Explain why ΔABC and ΔDBE are similar.

Since 2 pair of angles are congruent, the triangles are similar

b) What is the distance to the island?

$\frac{x}{8} = \frac{9}{3}$ $\boxed{x = 24 \text{ yds}}$

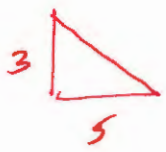
6) You can use indirect measurement to estimate the height of a flag pole. First measure your distance from the base of the flag pole and the distance from the ground to a point on the flag pole that you are looking at. Maintaining the same angle of sight, move back until the top of the flag pole is in your line of sight.

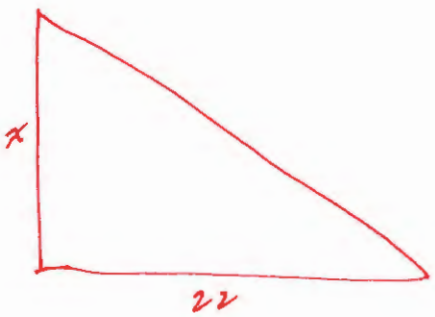


a) Explain why ΔABC and ΔDBE are similar.

Since 2 pairs of angles are congruent, the triangles are similar

b) What is the height of the flag pole?





$\frac{3}{x} = \frac{5}{22}$

$x = 13.2$

$13.2 + 4.5 = \boxed{17.7 \text{ ft}}$

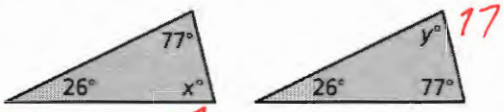
PUZZLE TIME!!!!

What Do You Call A Dandelion Floating In The Ocean?

Write the letter of each answer in the BOX BELOW containing the exercise number.

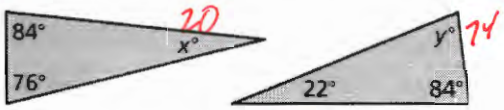
Choose the correct letter that describes the triangles.

1.



A. similar **B. not similar**

2.

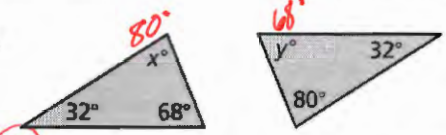


C. similar **D. not similar**

3.

E. similar **F. not similar**

4.



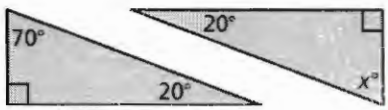
G. similar **H. not similar**

Answers
R. B
A. D
T. H
E. 58
D. A
M. E
S. G
E. 18
W. 70
N. C
E. F

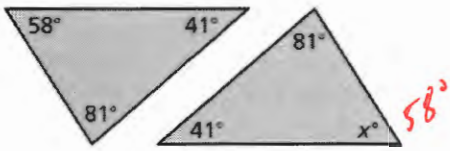
The triangles are similar. Find the value of *x*.

5.

6.



7.



4	7	2		6	5	3	1
S	E	A		W	E	E	D

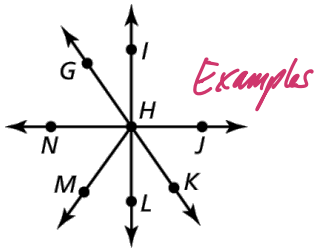
Name_____ Date_____

Unit 6 Chapter 12 & 3 Review

12.1 - Adjacent and Vertical Angles

Name two pairs of adjacent angles and two pairs of vertical angles in the figure.

1)



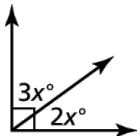
Examples

Adjacent: ∠IHJ & ∠JHK
∠NHM & ∠MHL

Vertical: ∠GHI & ∠LHK
∠NHL & ∠IHJ

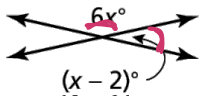
Tell whether the angles are *adjacent* or *vertical*. Then find the value of x.

2)



Adjacent
$x = 18°$

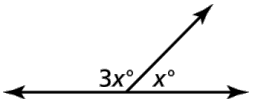
3)



$6x + (x-2) = 180$

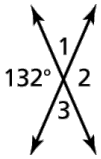
Adjacent
$x = 26°$

4)



Adjacent
$x = 45°$

5) What are the measures of the other three angles formed by



$m\angle 1 = 48°$
$m\angle 2 = 132°$
$m\angle 3 = 48°$

12.2 - Complementary and Supplementary Angles

For #6 & 7, tell whether the statement is *always*, *sometimes*, or *never* true. Explain.

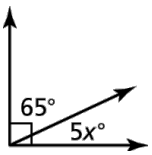
6) If x and y are supplementary angles, then y is acute. Sometimes. It could also be right or obtuse.

7) If x and y are complementary angles, then x is obtuse. Never. You can never have complementary obtuse angles

8) Angle x and angle y are complementary. Angle x is supplementary to a 128° angle. What are the measures of angle x and angle y?

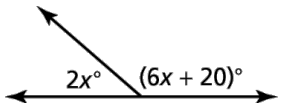
$x = 52°$
$y = 38°$

Tell whether the angles are *complementary* or *supplementary*. Then find the value of x.

9) 

Complementary

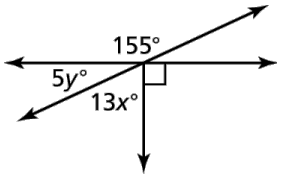
$x = 5°$

10) 

Supplementary

$x = 20°$

11) Find the values of x and y. Show all algebraic work.

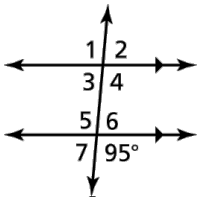


$x = 5°$

$y = 5°$

3.1 – Parallel Lines and Transversals

12) Use the figure to find the measure of the angle. **Explain your reasoning**.



a) $\angle 3$ = 85°

∠3 is congruent to ∠7 due to corresponding angles and ∠7 is supplementary to 95°

b) $\angle 5$ = 95°

Vertical angles

c) $\angle 6$ 85°

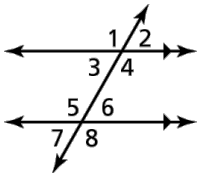
Supplementary angles

d) $\angle 2$ = 85°

∠2 is supplementary to ∠4, and ∠4 is congruent to 95° due to corresponding angles.

13) If the measure of $\angle 3 = 46°$, then the measure of $\angle 6 =$ 46°.

Why? Alternate interior angles are congruent



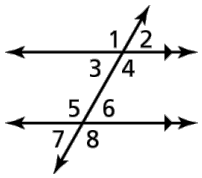
14) If the measure of $\angle 5 = 102°$, then the measure of $\angle 8 =$ 102°.

Why? Vertical angles are congruent

15) If the measure of $\angle 4 = 98°$, then the measure of $\angle 7 =$ 82°.

Why? ∠4 is supplementary to ∠3, and ∠3 is congruent to ∠7 due to corresponding angles

16) If the measure of $\angle 6 = 59°$, then the measure of $\angle 4 =$ 121°.

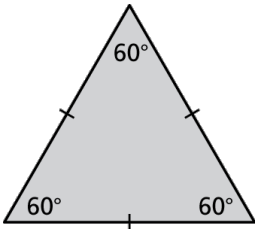


Why? ∠6 is congruent to ∠3 due to alternate interior angles, and ∠3 is supplementary to ∠4

12.3 - Triangles

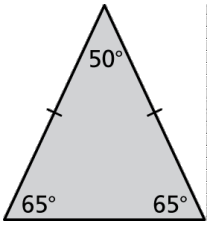
Classify the triangle.

17)



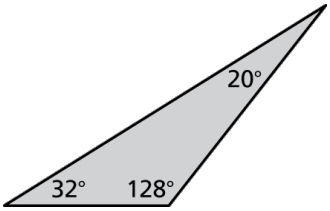
Equiangular
Equilateral
Isosceles
Acute Triangle

18)



Isosceles
Acute
Triangle

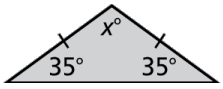
19)



Scalene
Obtuse
Triangle

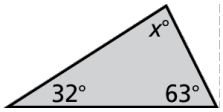
Find the value of x. Then classify the triangle. Show all work.

20)



$x = 110°$

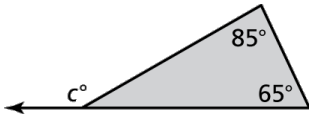
21)



$x = 85°$

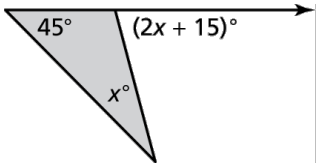
Find the measure of the exterior angle. Show all work.

22)



150°

23)



$x + 45 = 2x + 15$

$45 = x + 15$

$30 = x$

$2x + 15 = 2(30) + 15$

$= 60 + 15$

$= 75°$

Determine whether you can construct *many*, *one*, or *no* triangle(s) with the given description. Explain your reasoning.

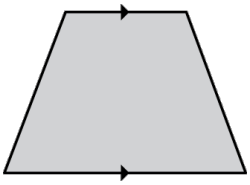
24) a triangle with a 2-inch side, a 4-inch side, and a 5-inch side ___one - scalene triangle___

25) a scalene triangle with two 7-centimeter sides ___NO - A scalene triangle cannot have 2 congruent sides.___

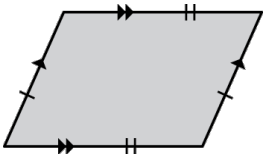
26) a triangle with one angle measure of 100° and one 6-inch side ___many - it depends on the location of the given angles and sides.___

12.4 - Quadrilateral

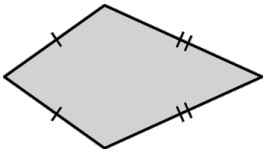
Classify the quadrilateral.

27) 

Trapezoid

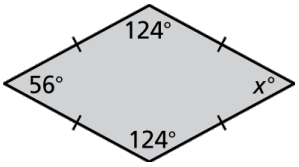
28) 

Parallelogram

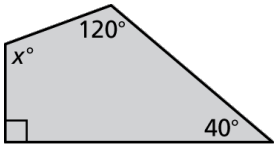
29) 

Kites

Find the value of x. Show all work.

30) 

$x = 56°$

31) 

$x = 110°$

Fill the blanks using *always*, *sometimes*, or *never* that would make the following statements true.

32 A square is ___always___ a rhombus.

33) A parallelogram is ___sometimes___ a rectangle.

34) A kite is ___never___ a square.

35) A trapezoid is ___never___ a square.

3.3 – Angles of Polygons

36) What is the formula to figure out the sum of all the interior angles of a polygon?

$S = (n-2)180$

37) What does ***n-2*** mean in the formula?

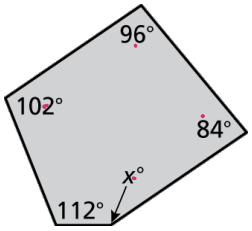
# of triangles that can be made inside a polygon

38) What do is the sum of all the exterior angles in any polygon?

360°

Find the measures of the interior angles of the polygon.

39)

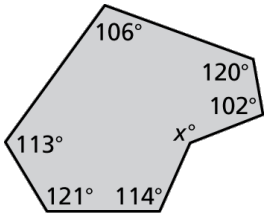


$S = (n-2)180$
$= (5-2)180$
$= 3 \times 180$
$= 540°$

$x + 112 + 102 + 96 + 84$
$x + 394 = 540$
$x = 146$

146°, 112°, 102°, 96°, 84°

40)



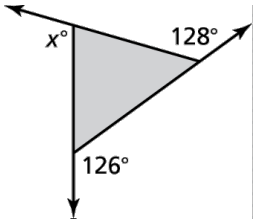
$S = (n-2)180$
$= (7-2)180$
$= 5 \times 180$
$= 900°$

$x + 114 + 121 + 113 + 106 + 120 + 102 = 900$
$x + 676 = 900$
$x = 224$

224°, 114°, 121°, 113°, 106°, 120°, 102°

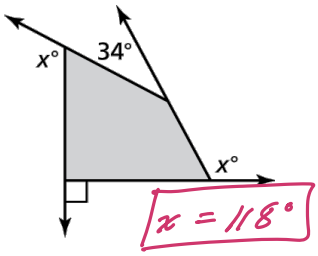
Find the measures of the interior angles of the polygon.

41)



$x = 106°$

42)



$x = 118°$

12.5 - Scale Drawings

Find the missing dimension. Use the scale factor 2 : 5.

43) Model: 10 km

Actual: 25 km

44) Model: 5 in.

Actual: 12.5 in

45) Model: 9.6 ft

Actual: 24 ft

46) Model: 13 m

Actual: 32.5 m

47) A scale drawing of a rose is 3 inches long. The actual rose is 1.5 feet long.

a) What is the scale of the drawing? $\frac{3\text{ in}}{1.5\text{ ft}} = \frac{2\text{ in}}{1\text{ ft}}$

b) What is the scale factor of the drawing? $\frac{1}{6}$