Name Key Class _____ Date _____

FINAL Review - Geometry CP

Section 1-3

Algebra For Exercises 20–22, use the figure below. Find the value of PT.

20. $PT = 5x + 3$ and $TQ = 7x - 9$ 33

21. $PT = 4x - 6$ and $TQ = 3x + 4$ 34

22. $PT = 7x - 24$ and $TQ = 6x - 2$ 130

$5x + 3 = 7x - 9$
$12 = 2x$
$6 = x$

$4x - 6 = 3x + 4$
$x = 10$

$7x - 24 = 6x - 2$
$x = 22$

Section 1-5 Fill in the missing angle measures.

Name an angle or angles in the diagram described by each of the following.

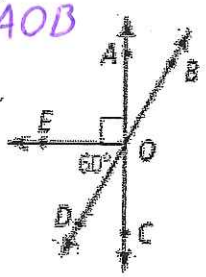
11. supplementary to $\angle AOD$ $\angle DOC$ or $\angle AOB$

12. adjacent and congruent to $\angle AOE$ $\angle EOC$

13. supplementary to $\angle EOA$ $\angle EOC$

14. complementary to $\angle EOD$ $\angle DOC$

15. a pair of vertical angles $\angle AOB$, $\angle DOC$



Section 1-7

Find the coordinates of the midpoint of $\overline{HX}$.

10. $H(0, 0), X(8, 4)$ $\frac{8}{2}, \frac{4}{2}$ $(4, 2)$

11. $H(-1, 3), X(7, -1)$ $\frac{-1+7}{2}, \frac{3+-1}{2}$ $\frac{6}{2}, \frac{2}{2}$ $(3, 1)$

12. $H(13, 8), X(-6, -6)$ $\frac{13-6}{2}, \frac{8-6}{2}$ $\frac{7}{2}, \frac{2}{2}$ $(3.5, 1)$

Find the distance between each pair of points. If necessary, round to the nearest tenth.

22. $J(2, -1), K(2, 5)$ $\sqrt{(2-2)^2+(-1-5)^2}$ $\sqrt{6^2} = 6$

23. $L(10, 14), M(-8, 14)$ $\sqrt{(10--8)^2+(14-14)^2}$ $\sqrt{18^2} = 18$

24. $N(-1, -11), P(-1, -3)$ $\sqrt{(-1--1)^2+(-11--3)^2}$ $\sqrt{8^2} = 8$

Section 1-8

41. The area of an 11-cm-wide rectangle is 176 cm². What is the length? $\frac{176}{11} = 16$

42. A square and a rectangle have equal areas. The rectangle is 64 cm by 81 cm. What is the perimeter of the square?

$64 \times 81 = 5184$ $\square_{side} = \sqrt{5184} = 72$ $P = 4(72)$
$= 288$

Section 2-2

Write the converse for each statement.

20. If you are a quarterback, then you play football. If you Play Football, Then you are The quarterback

21. Pianists are musicians. Musicians are Pianists

22. Algebra If $4x + 8 = 28$, then $x = 5$. If $x=5$, Then $4x+8=28$

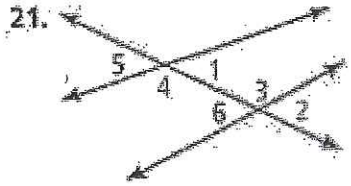
23. Odd natural numbers less than 8 are prime. Prime numbers are odd natural numbers less Than 8

24. Two lines that lie in the same plane are coplanar. Coplanar lines are two that lie in the same plane

Section 3-1

Are the pairs of angles listed, *alternate interior angles, same-side interior angles, corresponding angles,* or *alternate exterior angles*?

21.



a. 1 and 2 Corr

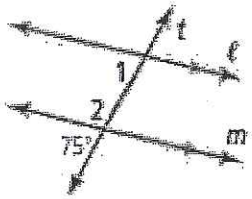
b. 3 and 4 AIA

c. 5 and 6 Corr

Section 3-2

Find $m\angle 1$ and $m\angle 2$. Justify each answer.

12.



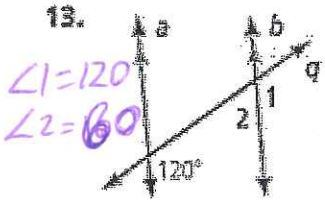
$\angle 1 = 75$

$\angle 2 = 105$

SSIA

Corr

13.



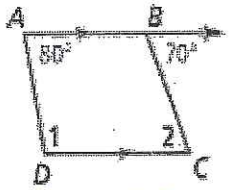
$\angle 1 = 120$

$\angle 2 = 60$

Linear Pair

Corr

14.



$\angle 1 = 100$ $\angle 2 = 70$

~~Corr~~ AIA

SSIA

Section 3-5

Use the given information to find the unknown angle measures in the triangle.

1. The ratio of the angle measures of the acute angles in a right triangle is 1:2.

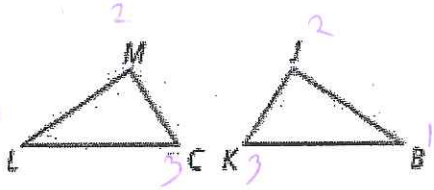
$180 = 90 + x + 2x$ $x = 30$ $\angle 1 = 30$ $\angle 2 = 60$

2. The ratio of the angle measures in a triangle are 1:2:3.

$180 = x + 2x + 3x$ $x = 30$ $\angle 1 = 30$ $\angle 2 = 60$ $\angle 3 = 90$

Section 4-1

$\triangle LMC \cong \triangle BJK$. Complete the congruence statements.



10. $\overline{LC} \cong$? $\overline{BK}$

11. $\overline{KJ} \cong$? $\overline{CM}$

12. $\overline{JB} \cong$? $\overline{ML}$

13. $\angle L \cong$? $\angle B$

14. $\angle K \cong$? $\angle C$

15. $\angle M \cong$? $\angle J$

16. $\triangle CML \cong$? $\triangle KJB$

17. $\triangle KBJ \cong$? $\triangle CLM$

18. $\triangle MLC \cong$? $\triangle JBK$

19. $\triangle JKB \cong$? $\triangle MCL$

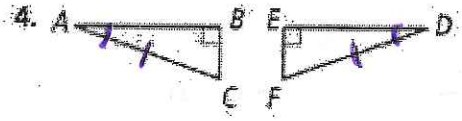
Section 4-2
Review Proofs with SSS Postulate and SAS Postulate

Section 4-3

Which postulate or theorem could you use to prove $\triangle ABC \cong \triangle DEF$?

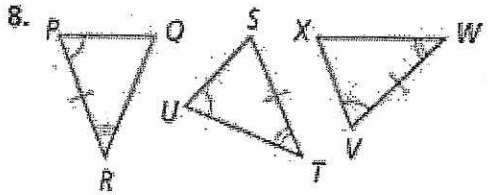
3. 

ASA

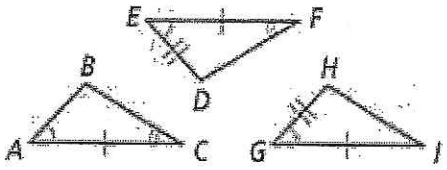
4. 

AAS

Name two triangles that are congruent by ASA.

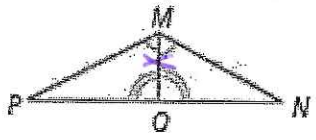
8. 

$\triangle PQR \cong \triangle VXW$

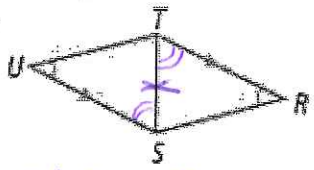
9. 

$\triangle ABC \cong \triangle EDF$

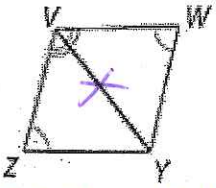
Determine whether the triangles must be congruent. If so, name the postulate or theorem that justifies your answer. If not, explain.

16. 

Yes, ASA

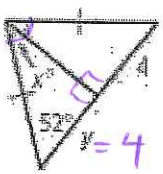
17. 

Yes, AAS

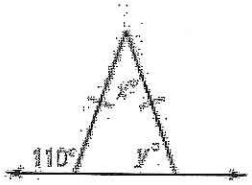
18. 

Yes, AAS

Section 4-5
Find the value of x and y.

11. 

$X = 90 - 52 = 38$

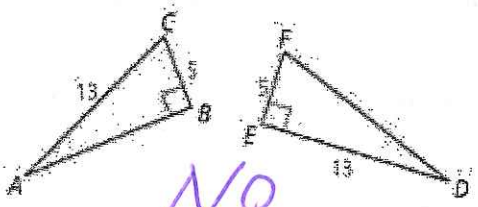
12. 

$Y = 70$

$X = 180 - 140 = 40$

Section 4-6

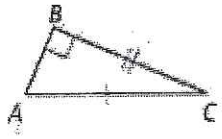
25. **Reasoning** Are the triangles congruent? Explain.



NO

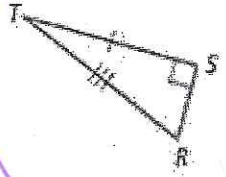
Can you conclude that the triangles are congruent? Explain.

34. $\triangle ABC$ and $\triangle LMN$



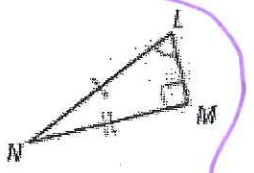
Yes, HL

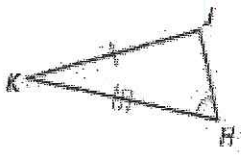
35. $\triangle LMN$ and $\triangle HJK$



NO

36. $\triangle RST$ and $\triangle ABC$



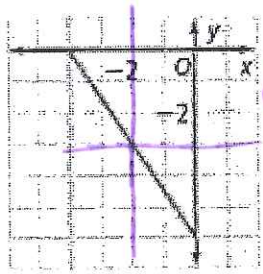


No

Section 5-3

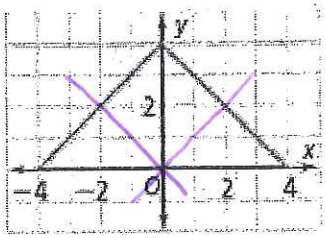
Coordinate Geometry Find the coordinates of the circumcenter of each triangle.

7.



(−2, −3)

8.

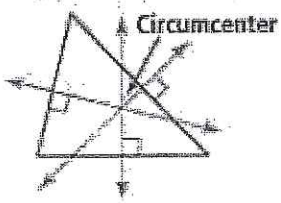


(0, 0)

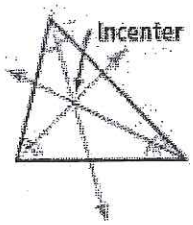
Section 5-4

Concept Summary Special Segments and Lines in Triangles

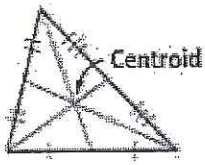
Perpendicular Bisectors



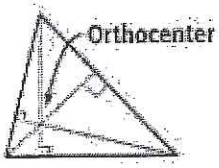
Angle Bisectors



Medians



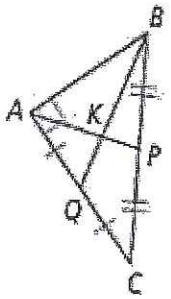
Altitudes



Use $\triangle ABC$ for Exercises 1–4.

1. Is $\overline{AP}$ a *median* or an *altitude*?
2. If $AP = 18$, what is KP? 6
3. If $BK = 15$, what is KQ? 7.5
4. Which two segments are altitudes?

$\overline{AC}, \overline{AD}$

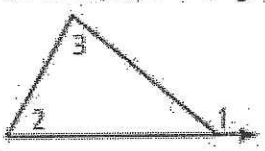


Section 5-6

Corollary Corollary to the Triangle Exterior Angle Theorem

Corollary
The measure of an exterior angle of a triangle is greater than the measure of each of its remote interior angles.

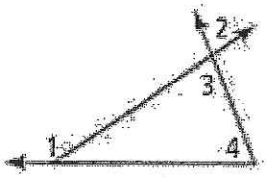
If . . .
$\angle 1$ is an exterior angle



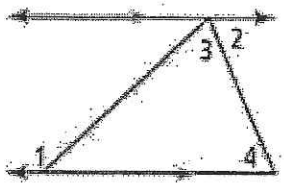
Then . . .
$m\angle 1 > m\angle 2$ and
$m\angle 1 > m\angle 3$

Explain why $m\angle 1 > m\angle 2$.

6.



8.

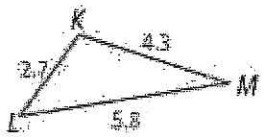


6) Since $\angle 2 = \angle 3$ and $\angle 3$ less than $\angle 1$, $\angle 1$ has to be greater than $\angle 2$.

8) Since $\angle 2 = \angle 4$ and $\angle 4$ is less than $\angle 1$, $\angle 1$ has to be greater than $\angle 2$

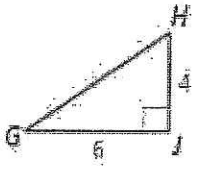
List the angles (#9, 11) or sides (#16, 17) of each triangle in order from smallest to largest.

9.



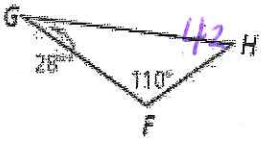
$\angle M, \angle L, \angle K$

11.



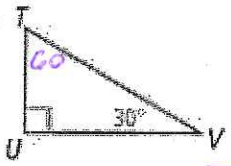
$\angle G, \angle H, \angle J$

16.



$\overline{FH}, \overline{GF}, \overline{GH}$

17.

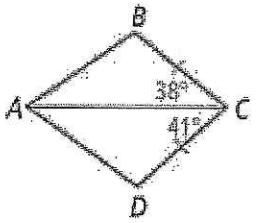


$\overline{TU}, \overline{UV}, \overline{TV}$

Section 5-7

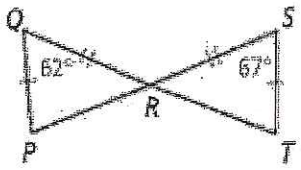
Write an inequality relating the given side lengths. If there is not enough information to reach a conclusion, write *no conclusion*.

6. AB and AD



$AB < AD$

7. PR and RT



$RT > RP$

Section 6-1

The sum of the interior angle measures of a polygon with n sides is given. Find n.

22. 180

3

23. 1080

$1080 = (n-2)180$

$6 = n-2$

$8 = n$

24. 1980

$1980 = (n-2)180$

$11 = n-2$

$n = 13$

25. 2880

$2880 = (n-2)180$

$16 = n-2$

$n = 18$

Section 6-4

What defines a rectangle, rhombus and square?

4 Right $\angle$'s

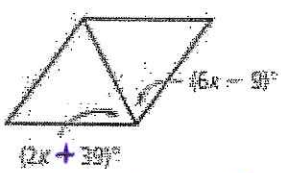
4 $\cong$ sides

4 Right $\angle$'s and 4 $\cong$ sides

Section 6-5

For what value of x is the figure the given special parallelogram?

11. rhombus

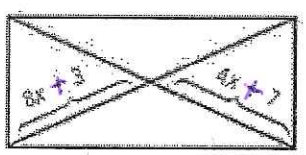


$2x + 39 = 6x - 9$

$48 = 4x$

$x = 12$

12. rectangle

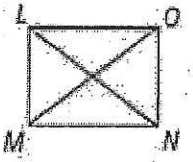


$8x + 3 = 4x + 7$

$4x = 4$

$x = 1$

13. rectangle



$LN = 4x - 7$

$MO = 2x + 13$

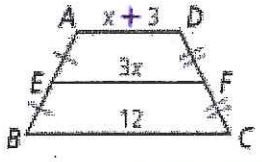
$4x - 7 = 2x + 13$

$2x = 20$

$x = 10$

Section 6-6

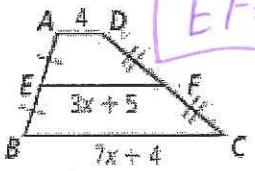
Find *EF* in each trapezoid.

13. 

$\frac{x+3+12}{2} = 3x$ EF = 9

$x + 15 = 6x$

$15 = 5x \quad x = 3$

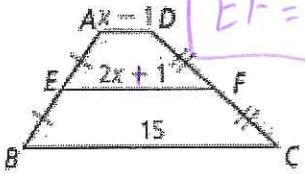
14. 

EF = 11

$\frac{4+7x+4}{2} = 3x+5$

$8 + 7x = 6x + 10$

$x = 2$

15. 

EF = 9

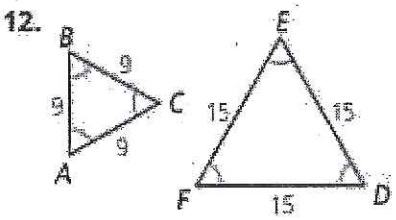
$\frac{x-1+15}{2} = 2x+1$

$x + 14 = 4x + 2$

$12 = 3x \quad x = 4$

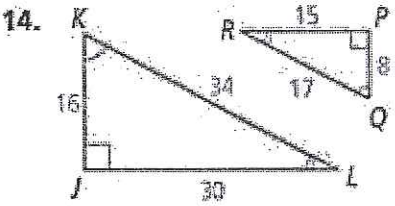
Section 7-2

Determine whether the polygons are similar. If so, write a similarity statement and give the scale factor. If not, explain.

12. 

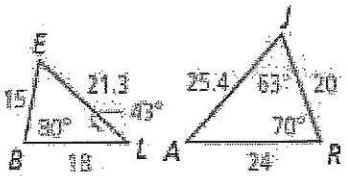
Yes, $\triangle ABC \sim \triangle EFD$

3 : 5

14. 

yes, $\triangle JKL \sim \triangle PQR$

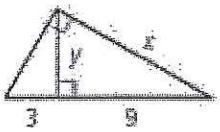
2 : 1

17. 

NO

Section 7-4

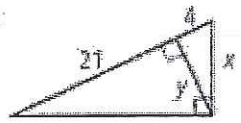
Algebra Solve for *x* and *y*.

18. 

$y^2 = 3 \cdot 9 \quad x^2 = 9 \cdot 12$

$y = \sqrt{27} \quad x = \sqrt{108}$

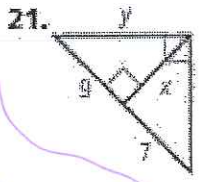
$y = 3\sqrt{3} \quad x = 6\sqrt{3}$

20. 

$x^2 = 4 \cdot 25 \quad y^2 = 4 \cdot 21$

$x = \sqrt{100} \quad y = \sqrt{84}$

$x = 10 \quad y = 2\sqrt{21}$

21. 

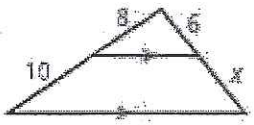
$y^2 = 9 \cdot 16 \quad x^2 = 9 \cdot 7$

$y = \sqrt{144} \quad x = \sqrt{63}$

$y = 12 \quad x = 3\sqrt{7}$

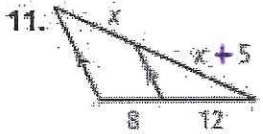
Section 7-5

Algebra Solve for *x*.

9. 

$\frac{8}{10} = \frac{6}{x}$

$x = 7.5$

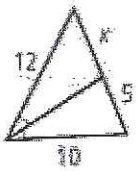
11. 

$\frac{x}{x+5} = \frac{8}{12}$

$12x = 8x + 40$

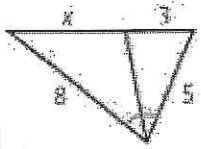
$4x = 40$

$x = 10$

19. 

$\frac{12}{x} = \frac{10}{5}$

$x = 6$

20. 

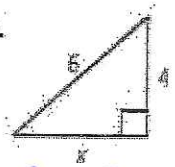
$\frac{8}{x} = \frac{5}{3}$

$x = 4.8$

Section 8-1

Find the value of x. Express your answer in simplest radical form.

16.

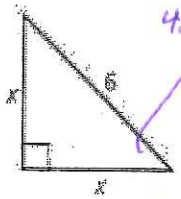


$x^2 + 4^2 = 6^2$

$x^2 = 36 - 16$

$x^2 = 20$ $\quad x = 2\sqrt{5}$

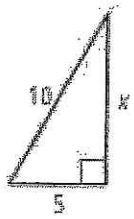
20. 45-45-90



$x = \frac{6}{\sqrt{2}}$

$x = \frac{6\sqrt{2}}{2} = 3\sqrt{2}$

21.



$x^2 + 5^2 = 10^2$

$x^2 = 100 - 25$

$x^2 = 75$

$x = 5\sqrt{3}$

The lengths of the sides of a triangle are given. Classify each triangle as *acute*, *right*, or *obtuse*.

27. 4, 5, 6 — Acute

$4^2 + 5^2 > 6^2$

$16 + 25 > 36$

28. 0.3, 0.4, 0.6 — obtuse

$.3^2 + .4^2 < .6^2$

$.09 + .16 < .36$

29. 11, 12, 15 — Acute

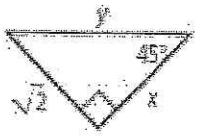
$11^2 + 12^2 > 15^2$

$121 + 144 > 225$

Section 8-2

Find the value of each variable. If your answer is not an integer, express it in simplest radical form.

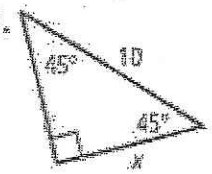
8.



$x = \sqrt{2}$

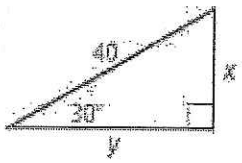
$y = 2$

11.



$x = 5\sqrt{2}$

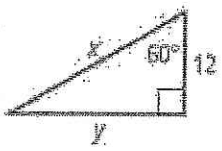
15.



$x = 20$

$y = 20\sqrt{3}$

18.



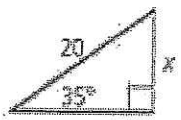
$x = 24$

$y = 12\sqrt{3}$

Section 8-3

Find the value of x. Round to the nearest tenth.

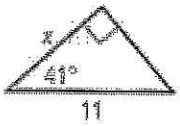
14.



$\sin 35 = \frac{x}{20}$

$x = 11.5$

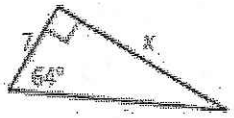
15.



$\cos 41 = \frac{x}{11}$

$x = 8.3$

16.

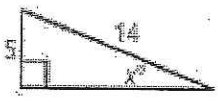


$\tan 64 = \frac{x}{7}$

$x = 14.4$

Find the value of x. Round to the nearest degree.

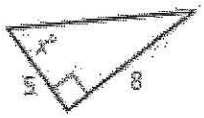
22.



$\sin x = \frac{5}{14}$

$x = 21°$

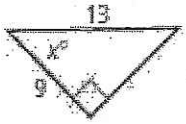
23.



$\tan x = \frac{8}{5}$

$x = 58°$

24.



$\cos x = \frac{9}{13}$

$x = 46°$

Section 8-4

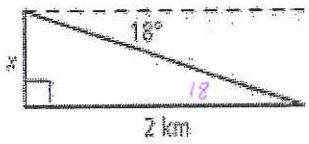
Find the value of x. Round to the nearest tenth of a unit.

20.

$\sin 27 = \frac{x}{580}$

$x = 263.3$

21.



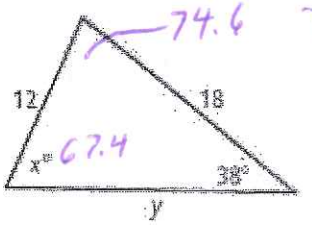
$\tan 18° = \frac{x}{2}$

$x = .6$

Section 8-5

Use the Law of Sines to find the values of x and y. Round to the nearest tenth.

10.

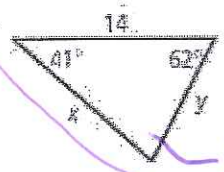


$\frac{\sin 38}{12} = \frac{\sin x}{18}$

$.92 = \sin x$

$x = 67.4°$

11.



$\frac{\sin 38}{12} = \frac{\sin 74.6}{y}$

$y = 18.8$

$\frac{\sin 77}{14} = \frac{\sin 62}{x} = \frac{\sin 41}{y}$

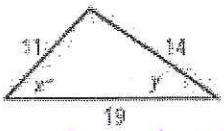
$x = 12.7$

$y = 9.4$

Section 8-6

Use the Law of Cosines to find the value of x and y. Round to the nearest tenth.

11.



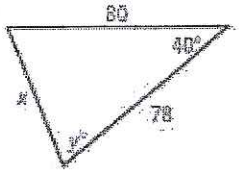
$11^2 = 14^2 + 19^2 - 2(14)(19)\cos Y$

$Y = 35°$

$14^2 = 11^2 + 19^2 - 2(11)(19)\cos X$

$X = 46.8°$

13.



$x^2 = 80^2 + 78^2 - 2(80)(78)\cos 40$

$x = 54$

Section 9-1

19. **Travel** You are visiting San Francisco. From your hotel near Union Square, you walk 4 blocks east and 4 blocks north to the Wells Fargo History Museum. Then you walk 5 blocks west and 3 blocks north to the Cable Car Museum. Where is the Cable Car Museum in relation to your hotel?

1 west and 7 north

22. ΔMUG has coordinates $M(2, -4)$, $U(6, 6)$, and $G(7, 2)$. A translation maps point M to $M'(-3, 6)$. What are the coordinates of U' and G' for the translation? What is the rule for the translation?

$T\langle -5, 10 \rangle$ $U' = (1, 16)$ $G' = (2, 12)$

Section 9-6

Magnification You look at each object described in Exercises 19–22 under a magnifying glass. Find the actual dimension of each object.

19. The image of a button is 5 times the button's actual size and has a diameter of 6 cm. $\frac{6}{5} = 1.2\text{cm}$

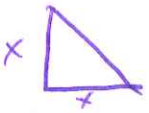
20. The image of a pinhead is 8 times the pinhead's actual size and has a width of 1.36 cm. $\frac{1.36}{8} = .17\text{cm}$

21. The image of an ant is 7 times the ant's actual size and has a length of 1.4 cm. $\frac{1.4}{7} = .2\text{cm}$

22. The image of a capital letter N is 6 times the letter's actual size and has a height of 1.68 cm. $\frac{1.68}{6} = .28$

Section 10-1

20. A right isosceles triangle has area 98 cm^2. Find the length of each leg.

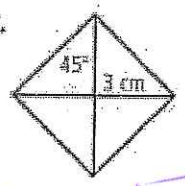


$98 = \frac{1}{2}x^2$ $x = 7$

Section 10-2

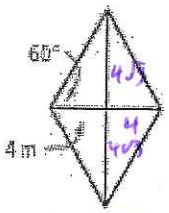
Find the area of each rhombus. Leave your answer in simplest radical form.

37.



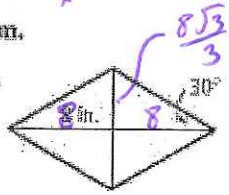
$\frac{1}{2}(6)(6) = 18$

38.



$\frac{1}{2}(8)(8\sqrt{3}) = 32\sqrt{3}$

39.



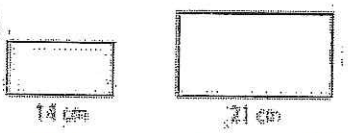
$\frac{8\sqrt{3}}{3}$

$\frac{1}{2}(16)\left(\frac{16\sqrt{3}}{3}\right) = \frac{128\sqrt{3}}{3}$

Section 10-4

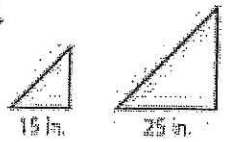
The figures in each pair are similar. Compare the first figure to the second. Give the ratio of the perimeters and the ratio of the areas.

11.



$k = 2/3$ $k^2 = 4/9$

12.



$k = \frac{3}{5}$ $k^2 = \frac{9}{25}$

Section 10-5

Names of Common Polygons

3	Triangle, or trigon
4	Quadrilateral, or tetragon
5	Pentagon
6	Hexagon
7	Heptagon
8	Octagon
9	Nonagon, or enneagon
10	Decagon
11	Hendecagon
12	Dodecagon
⋮	⋮
n	n-gon

Find the area of each regular polygon. Round your answer to the nearest tenth.

6. octagon with side length 6 cm
10. dodecagon with radius 20 cm
12. 18-gon with perimeter 72 mm

6) $a = \frac{3}{\tan 22.5} = 7.24$

$A = \frac{1}{2}(7.24)(48)$

$= 173.76$

10) $a = 20\cdot\cos(15) = 19.3$

$p = 24 \cdot 20\sin(15) = 124.2$

$A = \frac{1}{2}(19.3)(124.2)$

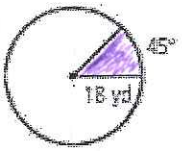
$= 1198.53$

12) $a = \frac{2}{\tan 10}$ $a = 11.3$

$A = \frac{1}{2}(11.3)(72) = 408.3$

Section 10-7

Find the area of each shaded sector of a circle. Leave your answer in terms of π.

13. 

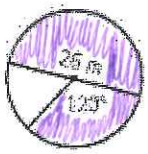
$\frac{45}{360} \cdot \pi 18^2$

$= 40.5\pi$

14. 

$\frac{90}{360} \cdot \pi 16^2$

$= 64\pi$

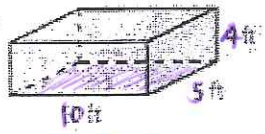
15. 

$\frac{300}{360} \cdot \pi 12.5^2$

$= 130.2\pi$

Section 11-2

Use formulas to find the surface area of each prism. Round your answer to the nearest whole number.

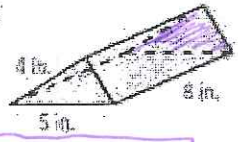
11. 

$LA = 30(4)$

$= 120$

$SA = 120 + 2(50)$

$= 220$

12. 

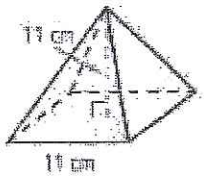
$LA = 12(8) = 96$

$SA = 96 + 2(6)$

$= 108$

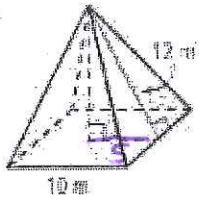
Section 11-5

Find the volume of each square pyramid. Round your answer to the nearest tenth if necessary.

9. 

$V = \frac{1}{3}(121)(11)$

$= 443.\overline{6}$

12. 

$h = \sqrt{12^2 - 5^2} = 10.9$

$V = \frac{1}{3}(100)(10.9)$

$V = 363.6$

Section 11-6

A sphere has the volume given. Find its surface area to the nearest whole number.

23. $V = 900\ \text{in.}^3$

$900 = \frac{4}{3}\pi r^3$

$r \approx 6$

$SA = 4\pi 6^2$

$= 451$

24. $V = 3000\ \text{m}^3$

$3000 = \frac{4}{3}\pi r^3$

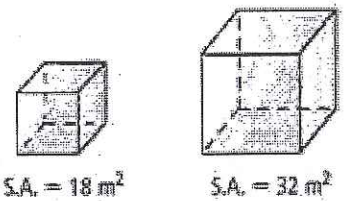
$r \approx 9$

$SA = 4\pi 9^2$

$= 1006$

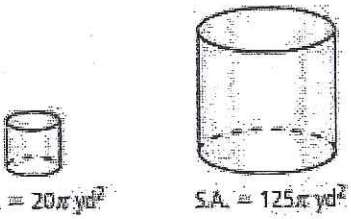
Section 11-7

Each pair of figures is similar. Use the given information to find the scale factor of the smaller figure to the larger figure.

13. 

$\sqrt{k^2} = \sqrt{18 \text{ to } 32}$

$k = 3 \text{ to } 4$

14. 

$\sqrt{k^2} = \sqrt{20 \text{ to } 125}$

$k = 2 \text{ to } 5$