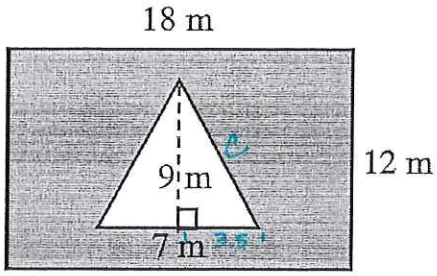
Name: KEY

Period: _____

MATH 2 - (Semester 1 Final STUDY GUIDE)

Practice Problem Set for Chapters 2, 3 & 4.2, 6

1)



$9^2 + 3.5^2 = c^2$

$81 + 12.25$

$\sqrt{93.25} = c^2$

$9.7 \approx c$

1) Find the Area of the shaded region.

$(18 \cdot 12) = 216$

subtract:

$\frac{1}{2}(7)(9) = 31.5$

$216 - 31.5$

Area= $184.5\ m^2$

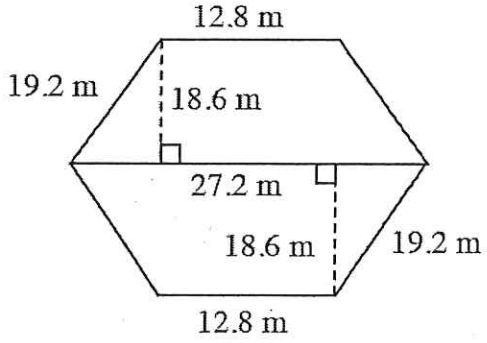
1) Find the perimeter of the triangle.

$(9.7)(2) + 7 = p$

$= 26.3$

Perimeter: $26.3\ m$

2)



2) Find the Area.

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

$\frac{1}{2}(12.8 + 27.2)(18.6) =$

372

$\times\ 2$

Area= $744\ m^2$

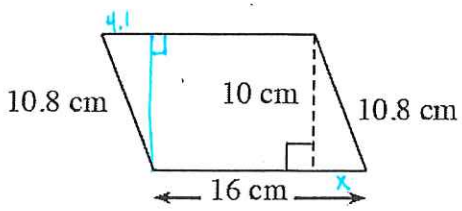
2) Find the perimeter.

$(19.2)(4) + 12.8(2) =$

$76.8 + 25.6 =$

Perimeter: $102.4\ m$

3)



3) Find the Area.

$10^2 + x^2 = (10.8)^2$

$100 + x^2 = 116.64$

$x \approx 4.1$

$\frac{1}{2}(4.1)(10)(2) + 10(11.9) =$

$41 + 119 =$

Area= $160\ cm^2$

3) Find the perimeter.

$(10.8)(2) + 16(2) =$

Perimeter: $53.6\ cm$

4) 87% of the population of California is right-handed. 17% of the population wears glasses or contact lenses. Create an area model to describe this situation.

glasses	right-handed: Yes (87%)	right-handed: No (13%)
17% Yes	14.8%	2.2%
No 83%	72.2%	10.8%

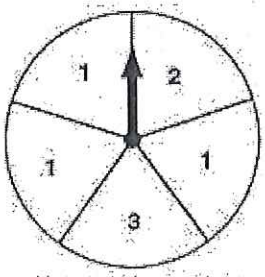
a) What is the probability that someone who is right handed also wears glasses or contacts?

14.8%

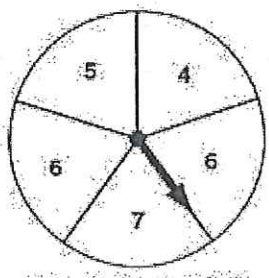
b) What is the probability that someone isn't right handed and doesn't wear glasses?

10.8%

5) You create a two digit number by spinning spinner A to get the tens digit and spinning spinner B to get the ones digit. The spinners are divided into equal parts. Create either an area model or a tree diagram to model the probability of this situation.



Spinner A (tens digit)



Spinner B (ones digit)

	spinn #1: 1 (3/5)	2 (1/5)	3 (1/5)
1/5 4	14	24 (1/25)	34 (1/25)
1/5 5	15 (3/25)	25 (1/25)	35 (1/25)
2/5 6	16 (6/25)	26 (2/25)	36 (2/25)
1/5 7	17 (3/25)	27 (1/25)	37 (1/25)
outcome	P		

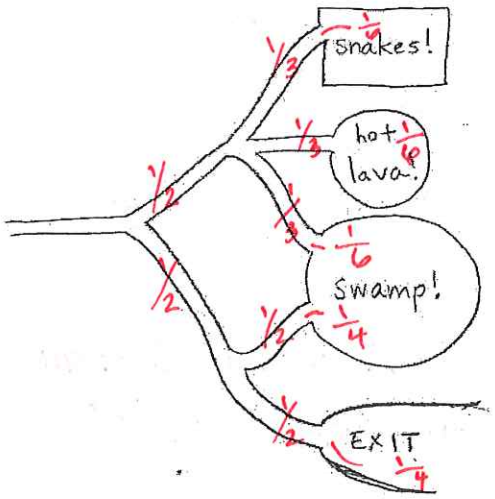
What is the probability of getting an even number? Show all work.

$\frac{3}{25} + \frac{1}{25} + \frac{1}{25} + \frac{6}{25} + \frac{2}{25} + \frac{2}{25} = \frac{15}{25}$

What is the probability of getting an odd number? Show all work.

$\frac{3}{25} + \frac{1}{25} + \frac{1}{25} + \frac{3}{25} + \frac{1}{25} + \frac{1}{25} = \frac{10}{25}$

6) Alma is stuck in a maze on the worst reality TV show ever!



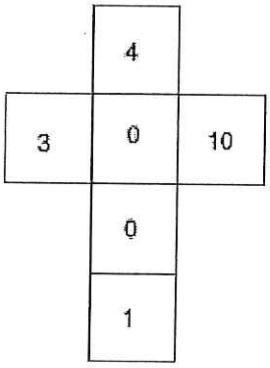
a) What is the probability she ends up in the swamp?

$\frac{1}{6} + \frac{1}{4} =$ common denominator: $\frac{2}{12} + \frac{3}{12} =$ $\boxed{5/12}$

b) What is the probability that she makes it safely to the exit?

$\boxed{\frac{1}{4}}$

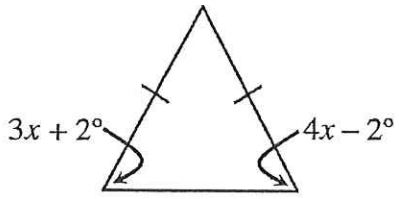
7) On the six-sided dice at right, you win the dollar amount of money you spin. Calculate the expected value of this game.



$0\left(\frac{2}{6}\right) + 4\left(\frac{1}{6}\right) + 3\left(\frac{1}{6}\right) + 10\left(\frac{1}{6}\right) + 1\left(\frac{1}{6}\right) =$

$18\left(\frac{1}{6}\right) =$ $\boxed{\$3.}$

8)



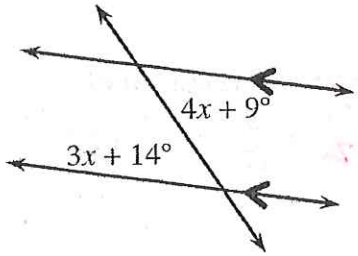
8) Justification: $\Delta <$ snm theorem

Equation: $3x + 2 = 4x - 2$

$4 = x$

x = 4

9)



9) Angle Relationship: alternate int. ∠'s are ≅

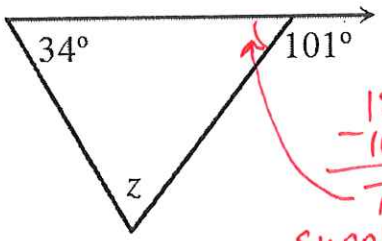
Equation: $4x+9 = 3x+14$

$4x = 3x+5$

$x = 5$

x = 5

10)



180 − 101 = 79°

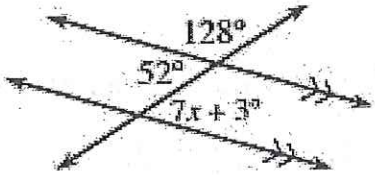
supplementary linear pair

10) Justification: Δ ∠ sum theorem

Equation: $34+79+z = 180°$

z = 67°

11)



11) Angle Relationship: alternate interior ∠'s are ≅

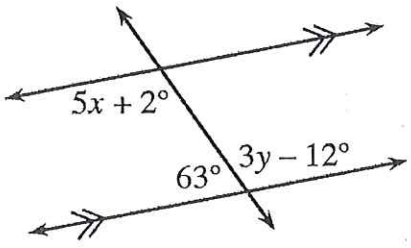
Equation: $52 = 7x+3$

$49 = 7x$

$x = 7$

x = 7

12)



12) Angle Relationship: alternate interior ∠'s are ≅, linear pairs

Equation:

$5x+2+63 = 180°$

$5x = 115$

$x = 23$

$3y-12+63 = 180$

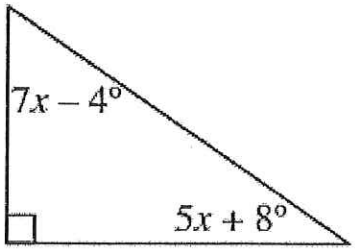
$3y+51 = 180$

$3y = 129$

y = 43

x = 23

13)



13) Justification: Δ < sum theorem

Equation: $7x-4+5x+8+90=180$

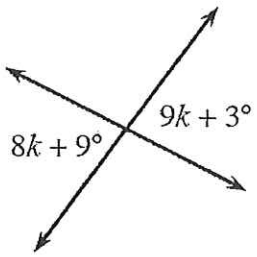
$12x+94=180$

$12x=86$

$x=7.2$

x = 7.2

14)



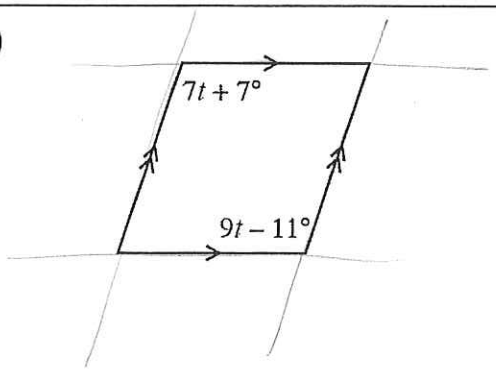
14) Angle Relationship: vertical ∠'s are ≅

Equation: $8k+9=9k+3$

$6=k$

k = 6

15)



15) Angle Relationship: corresponding ∠'s are ≅ linear pairs are ≅

Equation:

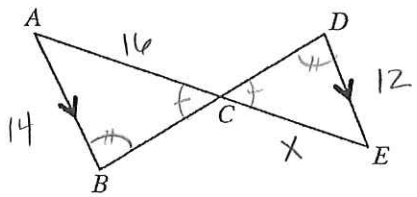
$7t+7=9t-11$

$18=2t$

$t=9$

t = 9

16) Use the similar triangles below. If $AB = 14$, $AC = 16$, and $DE = 12$, calculate CE.



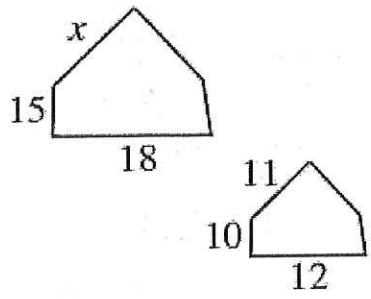
$\frac{14}{16}=\frac{12}{x}$

$192=14x$

$x=13.7$

CE = 13.7

17) In the diagram below, the figures are similar. Solve for x.



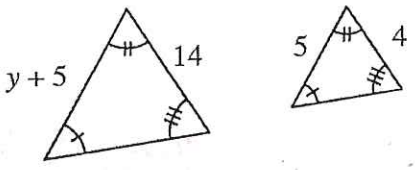
$\frac{11}{x} = \frac{10}{15}$

$10x = 165$

$x = 16.5$

x = 16.5

18) Examine the triangles below. Solve for *y*.



$\frac{y+5}{5} = \frac{14}{4}$

$70 = 4(y+5)$

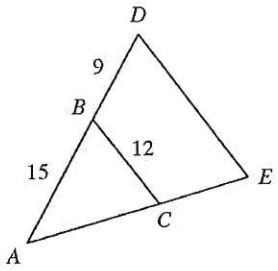
$70 = 4y + 20$

$50 = 4y$

$y = 12.5$

y = 12.5

19). In the diagram below, $\Delta ABC \sim \Delta ADE$. What is DE?



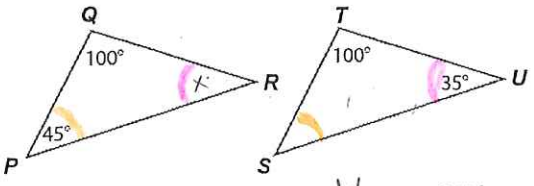
$\frac{15}{12} = \frac{15+9}{x}$

$288 = 15x$

$x = 19.2$

DE = 19.2

20) Determine if the triangles below are similar. If so, explain how you know and write a similarity statement.



Yes,

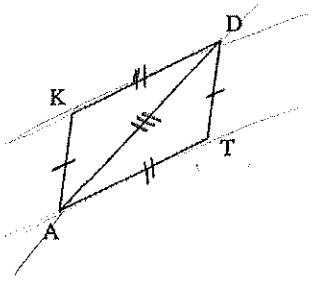
$\Delta PQR \sim \Delta STU$ by AA~

Δ < sum theorem

$100 + 45 + x = 180$

$x = 35$

21) In the figure below, if $\overline{KD} = \overline{AT}$ and $\overline{AK} = \overline{TD}$, is it true that $\angle K \cong \angle T$? Use a flowchart to explain your answer.



$\overline{KD} = \overline{AT}$ given

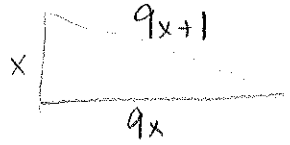
$\overline{AK} = \overline{TD}$ given

$\overline{AD} = \overline{DA}$ shared side/ reflexive

$\triangle AKD \cong \triangle DTA$ by SSS$\cong$

$\angle K \cong \angle T$ $\cong$ $\triangle$'s have $\cong$ parts

23) The perimeter of a triangle is 39 inches. The second side is 9 times as long as the first side. The third side is 1 inch longer than the second side. What is the length of each side? Show your work.



$x + 9x + 1 + 9x = 39$

$19x + 1 = 39$

$19x = 38$

$x = 2$

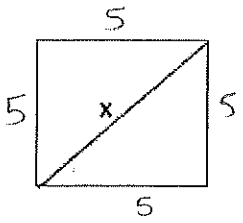
side lengths: 2, 18, 19

$x = 2$

$9(2) = 18$

$9(2) + 1 = 19$

24) The area of the square below is 25 cm^2. Determine the side lengths and the diagonal (x) of square.



side lengths = 5cm

because they're $=$, this is a 45:45:90;

so diagonal = $5\sqrt{2}$ cm

20)

+ 3	18y	-3
y	$6y^2$	$-y$
	$6y$	-1

Area as a product: $(6y-1)(y+3)$

Area as a sum: $6y^2 + 17y - 3$

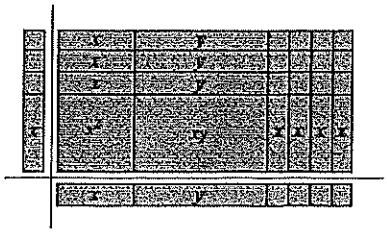
21)

5	10x	-10
x	$2x^2$	$-2x$
	2x	-2

Area as a product: $(2x-2)(x+5)$

Area as a sum: $2x^2 + 8x - 10$

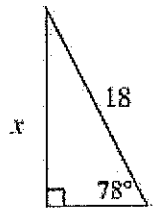
22)



Area as a product: $(x+y+4)(x+3)$

Area as a sum: $x^2 + 7x + xy + 3y + 12$

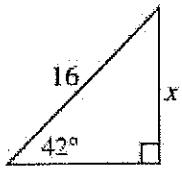
23) Set up an equation and the missing side length or variable.



$\sin 78 = \frac{x}{18}$

$(\sin 78)\,18 = x$

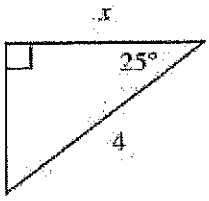
$x = 17.6$



$\sin 42 = \frac{x}{16}$

$(\sin 42) \cdot 16 = x$

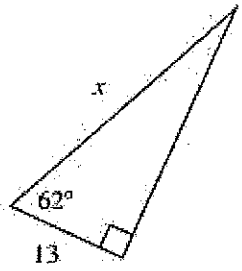
$x = 10.7$



$\cos 25 = \frac{x}{4}$

$(\cos 25) \cdot 4 = x$

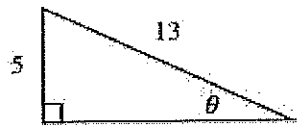
$x = 3.6$



$\cos 62 = \frac{13}{x}$

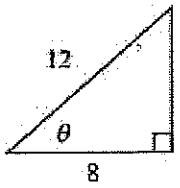
$\frac{13}{(\cos 62)} = x$

$x = 15.3$



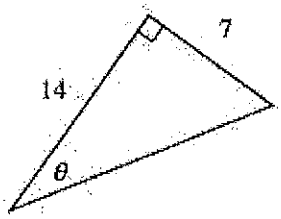
$\sin^{-1}\left(\frac{5}{13}\right) =$

$\theta = 22.6°$



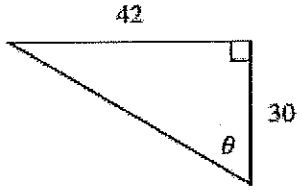
$\cos^{-1}\left(\frac{8}{12}\right)$

$\theta = 48.2°$



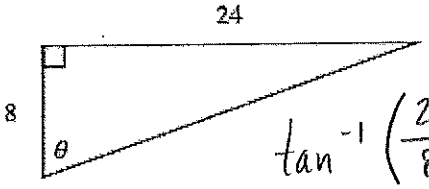
$\tan^{-1}\left(\frac{7}{14}\right)$

$\theta = 26.6°$



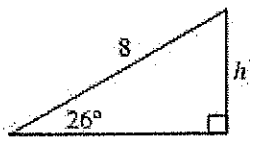
$\tan^{-1}\left(\frac{42}{30}\right)$

$\theta = 54.5°$



$\tan^{-1}\left(\frac{24}{8}\right)$

$\theta = 71.6°$



$\sin 26 = \frac{h}{8}$

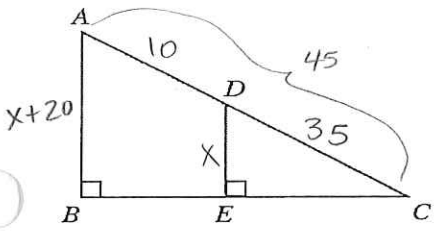
$(\sin 26) \cdot 8 = x$

$x = 3.5$

24) Calculate the value or rewrite the expressions below.

a) $(\sqrt{3})^4$ $(3^{\frac{1}{2}})^4 = 3^{4/2} = 3^2 = 9$	b) $9^{7/2}$ $(\sqrt{9})^7 = 3^7 = 2{,}187$	c) $\sqrt[3]{2^5}$ $\sqrt[3]{32}$ $2 \cdot 2 \quad 2 \cdot 2 \cdot 2$ $= 2\sqrt[3]{2}$
d) $(\sqrt{5})^6$ $(5^{\frac{1}{2}})^6 = 5^3 = 125$	e) $49^{5/2}$ $(\sqrt{49})^5 = 7^5 = 16{,}807$	f) $\sqrt[4]{81^3}$ $(\sqrt[4]{81})^3 = 3^3 = 27$
g) $64^{2/3}$ $(\sqrt[3]{64})^2 = 4^2 = 16$	h) $25^{5/2}$ $(\sqrt{5})^5 = 3{,}125$	i) $81^{7/4}$ $(\sqrt[4]{81})^7 = 3^7 = 2{,}187$

25) In the triangle below, AD = 10, AC=45, AB = x +20, and DE = x. Solve for x.



$$\frac{45}{x+20} = \frac{35}{x}$$

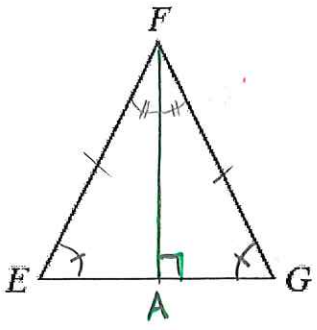
$$35(x+20) = 45x$$

$$35x + 700 = 45x$$

$$700 = 10x$$

$$x = 70$$

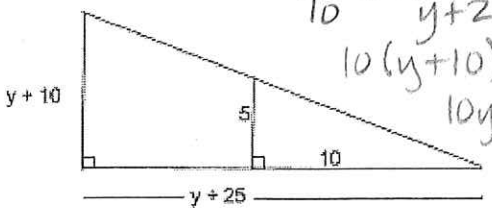
26) Assume that $\angle E \cong \angle G$ in the diagram at right. Add an auxiliary line so that you can use two congruent triangles to prove that the triangle must be isosceles. Complete the proof below.



Statements	Reasons
$\angle G \cong \angle E$	given
$\angle EFA \cong \angle GFA$	definition of angle bisector
$\overline{FA} \cong \overline{FA}$	reflexive property, shared side
$\triangle EFA \cong \triangle GFA$	by AAS $\cong$
$\overline{EF} \cong \overline{GF}$	$\cong \triangle$'s have $\cong$ parts
$\triangle EFG$ is isosceles	definition of isosceles

Math 2: **Semester 1 FINAL REVIEW: Multiple Choice Section**

1. Solve for y.
   a. y = 20
   b. y = 10
   c. y = 5
   d. y = 100



$\frac{5}{10} = \frac{y+10}{y+25}$

$10(y+10) = 5(y+25)$

$10y + 100 = 5y + 125$

$5y = 25$

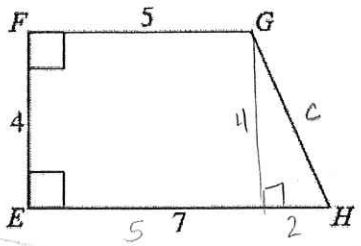
$y = 5$

2. Calculate the area of trapezoid FEHG.
   a. 33.4 $units^2$
   b. 24 $units^2$
   c. 48 $units^2$
   d. 50 $units^2$

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

$\frac{1}{2}(5+7)4 =$

$24 = \text{Area}$



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

$20 = c^2$

$\sqrt{20} = c^2$

$4.5 = c$

3. Calculate the perimeter of the trapezoid FEHG.
   a. 24.4 units
   b. 30.8 units
   c. 45.2 units
   d. 20.5 units

$7 + 4 + 5 + 4.5 = p$

$20.5 = p$

4. Only sophomores and juniors are allowed to take the graphic design class at Shelby High School. When the principal randomly selects a student in the graphic design class to create the yearbook, there is a ¼ chance of selecting a sophomore. If there are 9 sophomores in the class, how many juniors there?
   a. 27 juniors in the class
   b. 36 juniors in the class
   c. 20 juniors in the class
   d. 15 juniors in the class

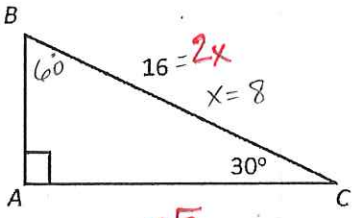
$\frac{1}{4} = \frac{9}{x+9}$

$36 = x + 9$

$x = 27$

5. Examine the triangle below at right. Determine the measures of AC.
   a. AC = $16\sqrt{3}$
   b. AC = $2\sqrt{2}$
   c. AC = 12
   d. AC = $8\sqrt{3}$

30°-60°-90° Δ!



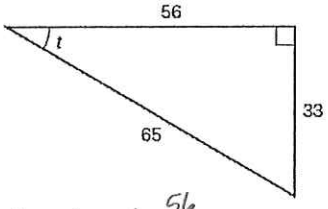
6. Use any trigonometric ratio of your choice to calculate the measure of <t.
   a. ∠t = 30.5°
   b. ∠t = 50.8°
   c. ∠t = 53.5°
   d. ∠t = 34.2°

$\sin^{-1} t = \frac{33}{65}$

$t \approx 30.5°$

(OR) $\tan^{-1} = \frac{33}{56}$

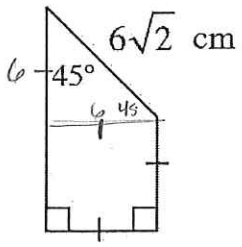
$t = 30.5°$



OR $\cos^{-1} = \frac{56}{65}$

$t \approx 30.5°$

7. Find the area of the polygon at right.
   a. 68 cm^2
   b. 36 cm^2
   c. 54 cm^2
   d. 93 cm^2



45°-45°-90° Δ

$(6 \cdot 6) + \frac{1}{2}(6)(6) =$

$36 + 18 = 54$

8. Find the perimeter of the polygon at right.
   a. $36 + \sqrt{2}$ cm
   b. $24 + 6\sqrt{2}$ cm
   c. $50 + 6\sqrt{2}$ cm
   d. none of the above

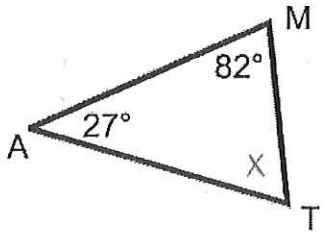
$(6 \cdot 4) + 6\sqrt{2} =$

$24 + 6\sqrt{2}$

9. In △AMT at right, what is the measure of ∠T?
   a. ∠T = 59°
   b. ∠T = 50°
   c. ∠T = 71°
   d. ∠T = 90°

$82 + 27 + x = 180°$

$x = 71°$



10. In △AMT at right, which side has the longest length?
    a. AT
    b. AM
    c. MT
    d. cannot be determined

The longest side is opposite the largest angle.

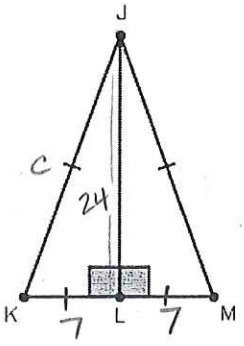
11. For the diagram below, if the triangles are congruent, determine the value of JK, when LM = 7 cm, JL = 24 cm. If there is not enough information to determine the value of x, state, "cannot be determined."
    a. JK = 25 cm
    b. JK = 50cm
    c. JK = 100 cm
    d. cannot be determined

$7^2 + 24^2 = c^2$

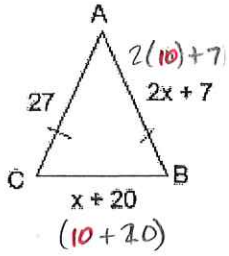
$49 + 576 = c^2$

$\sqrt{625} = c^2$

$c = 25$



12. The triangle at right, △ABC, is isosceles. Determine the perimeter of △ABC.
    a. 10 units
    b. 27 unit
    c. 90 units
    d. 84 units



$27 = 2x + 7$

$20 = 2x$

$x = 10$

$27 + 27 + 30 = 84$

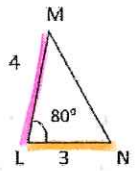
13. Rewrite the area as a product and a sum.
    a. $(2x + 4)(3x + 7) = 12x^2 - 9x + 28$

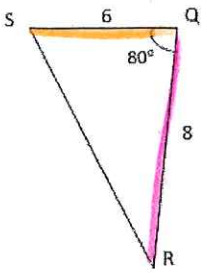
-7	-14x	28
3x	$6x^2$	-12x
	2x	-4

$6x^2 - 26x + 28$

b. $(2x - 4)(3x - 7) = 6x^2 - 26x + 28$
c. $(2x + 4)(3x + 7) = 2x^2 - 9x + 12$
d. $(2x + 4)(3x + 7) = x^2 - 9x - 28$

14. Use the triangles at right to answer the following questions. Are the triangles similar? How do you know they are similar?

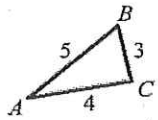


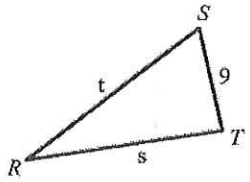


a. △LMN ~ △QRS by SAS~
b. △LMN ~ △QRS by AA~
c. △LMN ~ △QRS by SS~
d. The triangles are not similar.

$\frac{4}{8} = \frac{1}{2}$ $\frac{3}{6} = \frac{1}{2}$ SAS~

15. △ABC ~ △RTS Determine the length of t and s.





a. t = 20, s = 40
b. t =15, s = 12
c. t = 12, s = 22
d. t = 13, s = 3

$\frac{5}{t} = \frac{3}{9}$ $3t = 45$ $t = 15$

$\frac{3}{9} = \frac{4}{s}$ $36 = 3s$ $s = 12$

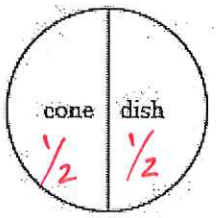
16. Rewrite the expression **(3x + 9)(x - 5)** as a sum.
a. $6x^2 - 9x - 28$
b. $5x^2 - 10x - 45$
c. $3x^2 - 6x - 45$
d. $x^2 - 9x + 45$

+9	$9x$	-45
$3x$	$3x^2$	$-15x$
	x	-5

17. Solve for x: **5x + 15 = 3 (x - 1) - x**
a. x = - 7
b. x = -15
c. x = 6
d. x = - 6

$5x + 15 = 3x - 3 - x$
$5x + 15 = 2x - 3$
$3x = -18$
$x = -6$

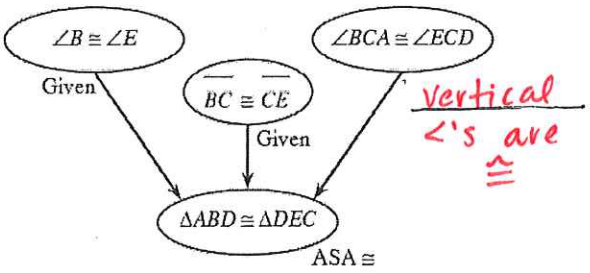
18. Eliza likes to make daily events into games of chance. For instance, before she went to buy ice cream at the local ice cream parlor, she created two spinners. The first has her three favorite flavors while the second has "cone" and "dish." Eliza will order whatever comes up on the spinners. What is the probability that she will be eating tutti fruitti ice cream from a dish?

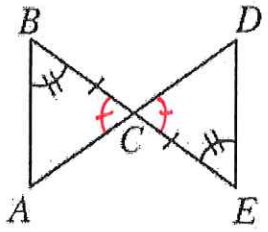


a. P (tutti-fruitti and dish) = 2/5
b. P (tutti-fruitti and dish) = 1/6
c. P (tutti-fruitti and dish) = 3/9
d. P (tutti-fruitti and dish) = 3/5

$\frac{1}{3} \cdot \frac{1}{2} = \frac{1}{6}$

19. Provide the missing reason in the proof below to show that the triangles are congruent.





a. < BCA≅ <ECD; vertical angles are ≅
b. < BCA≅ <ECD; alternate interior angles are ≅
c. < BCA≅ <ECD; alternate interior angles are ≅
d. < BCA≅ <ECD; given

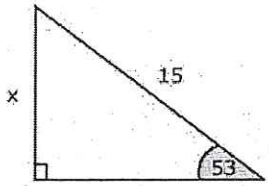
20. Determine the approximate length of x.

a. x = 15
b. x = 12
c. x = 20
d. x = 18

$\sin 53° = \frac{x}{15}$

$(\sin 53°)(15) = x$

$x \approx 11.9$



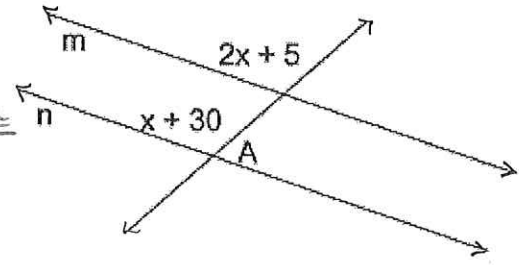
21. Joaquin is going out to lunch. The "Sandwich-Cookie-Combo Special" is his choice of a type of sandwich and a type of cookie. There are five types of sandwiches: turkey, ham, roast beef, peanut butter, and cucumber. There are three types of cookies: chocolate chip, snickerdoodle, and oatmeal. Assume all choices are made randomly. What is the probability that Joaquin of picks a Combo Special without meat.

a. P(no meat) = 1/15
b. P(no meat) = 3/15
c. P (no meat) = 2/5
d. P (no meat) = 1/2

$\frac{1}{5} + \frac{1}{5} = \frac{2}{5}$

Peanut Butter Cucumber

22. In the figure on the right, lines m and n are parallel. Solve for x and find m <A.



a. ∠A = 59°
b. ∠A = 79°
c. ∠A = 101°
d. ∠A = 125°

corresponding ∠'s are ≅

$2x + 5 = x + 30$

$x = 25$

$(25) + 30 + m\angle A = 180$ — supplementary linear pair

$55 + m\angle A = 180$

$m\angle A = 125°$