Final Exam Review

Name: _____

7th Grade Math

1) Simplify.

a. $-12 + 20$

8

b. $10 + -4$

14

c. $-40 + -23$

-63

d. $9 \div -3$

-3

e. $(-5)^2$

$-5 \cdot -5$

25

f. -3^2

$-3 \cdot 3$

-9

g. $-8 - a$

if $a = -8$

$-8 - (-8)$

0

h. $10 - a$

if $a = -12$

$10 - (-12)$

22

i. $-a + -6$

if $a = -11$

$-(-11) + -6$

5

j. $-4 - a$

if $a = |4|$

$-4 - |4|$

$(-4) - 4$

-8

k. $-10 \bullet a$

if $a = |-5|$

$-10 \cdot |-5|$

$-10 \cdot 5$

-50

l. $-3 \bullet a$

if $a = -|3|$

$-3 \cdot -|3|$

$-3 \cdot -3$

9

2) Convert the following to a decimal.

a. $\frac{4}{9}$ = .4

b. $6\frac{1}{8}$ = 6.125

$$\begin{array}{r} 0.444 \\ 9\overline{)4.000} \\ -36 \\ \hline 40 \\ -36 \\ \hline 40 \end{array}$$

$$\begin{array}{r} 0.125 \\ 8\overline{)1.000} \\ -8 \\ \hline 20 \\ -16 \\ \hline 40 \end{array}$$

3) You decide you want to find out how many deer are in your woods in your back yard. You tag 345 deer and release them back in the wild. A year later, you collect a sample of 980 deer, 120 of which are tagged. Estimate the total deer population in that area.

tagged / total

$$\frac{120}{980} \times \frac{345}{x}$$

$$\frac{120x}{120} = \frac{338,100}{120}$$

$x = 2817.5 \rightarrow$ **2818 deer**

4) What is a biased sample? What is a random sample? Which is better?

A biased sample is a sample that doesn't fully represent the population. A random sample doesn't have bias & represents the population. So a random sample is better.

5) A representative sample of 40 junior high students were surveyed about their favorite core class. ELA was chosen by 18 students. Based on this information, how many of the school's 520 students would you expect to choose ELA as their favorite?

ELA / total

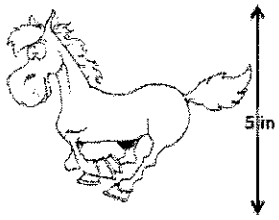
$$\frac{18}{40} \times \frac{x}{520}$$

$$\frac{9360}{40} = \frac{40x}{40}$$

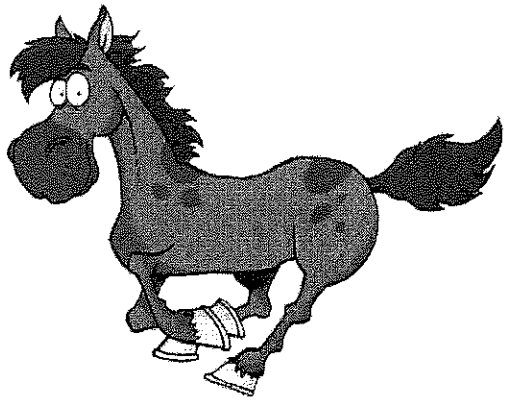
$234 = x$ students

6) The scale drawing of the horse below uses a scale factor of 1 inch = 12 inches. Find the actual height of the horse.

$5 \times 12 =$ **60 inches**

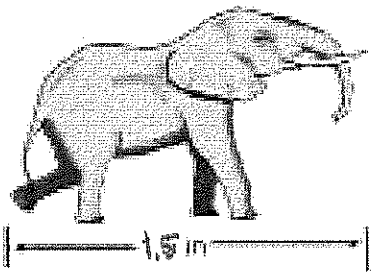


Drawing of a Horse


Actual Horse

7) The image below is a scale drawing of an elephant. It was drawn with a scale of 1 inch = 6 ft feet. Find the actual length of the elephant in feet.

$1.5 \times 6 =$ **9 ft**



8) In a new board game, players have to roll a fair, six sided die and flip a coin.

a. What is the probability that a player will roll the #1 and flip tails in the same turn?

$\frac{1}{6} \cdot \frac{1}{2} = \frac{1}{12} = .08\overline{3} = 8.3\%$

b. What is the probability that a player will roll an even number and flip heads in the same turn?

$\frac{3}{6} \cdot \frac{1}{2} = \frac{3}{12} = .25 = 25\%$

9) A bag contains 3 red marbles, 5 blue marbles, and 9 green marbles?

a. What is the probability of drawing a blue marble?

RRR
BBBBB
GGGGGGGGG

$\frac{5}{17} = .294 = 29\%$

b. What is the probability of drawing a green marble followed by a red marble **without replacement**?

$\frac{9}{17} \cdot \frac{3}{16} = \frac{27}{272} = .0992 = 10\%$

10) There are 12 people on Kyla's volleyball team. If the coach is randomly choosing players to lead a drill, what is the probability that Kyla will be chosen two times in a row?

$\frac{1}{12} \cdot \frac{1}{12} = \frac{1}{144} = .0069 = 1\%$

11) If I flip a coin 6 times, find the probability that they all will land on heads.

$\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{64} = .0156 = 2\%$

12)Juan goes to a fast food restaurant with the following options...

Main Dish	**Side Dish**	**Beverages**
Hamburger	Salad	Soda
Hotdog	French Fries	Water
Pizza		Juice
Chicken Tenders		
Sub Sandwich		

a) What is the probability that Juan orders a sub sandwich with salad and water?

$\frac{1}{5} \cdot \frac{1}{2} \cdot \frac{1}{3} = \frac{1}{30} = .033\ldots$ = 3%

b) List all of the main dish, side dish combinations that can be made from this restaurant. (NOTE: We are not factoring in the beverage options for this question.)

Ham	S
Hot	S
P	S
C	S
Sub	S

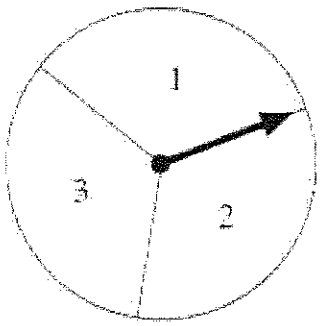
Ham	F
Hot	F
P	F
C	F
Sub	F

13) An owner of a small movie theater is gathering data and finds that in the last week there ~~have been~~ were 102 customers who saw the Disney film, 84 who saw the suspense film, and 67 who saw the romantic comedy. Based on this information what is the probability that the next customer to arrive will want to view the romantic comedy?

$$\begin{array}{r} 102 \\ 84 \\ +\ 67 \\ \hline 253 \end{array}$$

$\frac{67}{253} = .264$ = 26%

14) The spinner pictured to the right was spun 60 times. The results are in the table below...



Number	**Outcomes**
1	28
2	20
3	12

Based on these outcomes if the spinner is spun 20 more times, how many times will it land on 2 or 3?

$$\begin{array}{r} 28 \\ 20 \\ 12 \\ \hline 60 \end{array}$$

$$\begin{array}{r} 20 \\ +12 \\ \hline 32 \end{array}$$

$\frac{32}{60} = \frac{x}{20}$

$\frac{640}{60} = \frac{60x}{60}$

$10.\overline{6} = x$

11 times

15) Marie's wallet has a lot of change in it. The probability of randomly selecting each coin is listed in the table. Which coin is **most likely** to be selected at random?

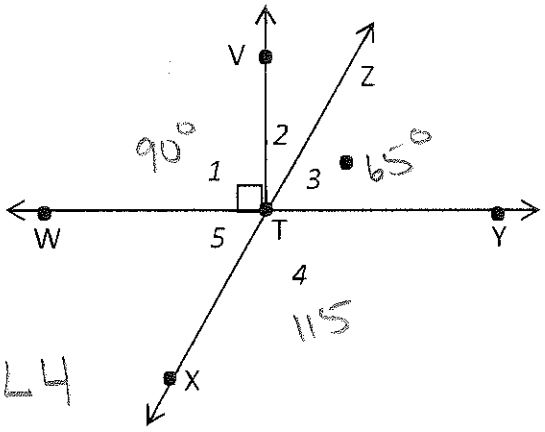
Penny

Coin	Probability
Penny	$\frac{4}{9}$ $\frac{8}{18}$
Nickel	$\frac{5}{18}$ $\frac{5}{18}$
Dime	$\frac{1}{9}$ $\frac{2}{18}$
Quarter	$\frac{1}{6}$ $\frac{3}{18}$

16) What is the probability of rolling a 2 or lower on a standard dice?

$\frac{2}{6} = \frac{1}{3} = .\overline{3} =$ 33.3̄2

17)Use the picture to the right to answer the following:



a) What angle is complementary to <2 ? ∠3

b) What angle is vertical to <5 ? ∠3

c) What angle is supplementary to <3 ? ∠4

d) What 2 angles are adjacent to <5 ? ∠1 and ∠4

e) What angle is complementary to <5 ? ∠2

f) What angle is vertical to <4 ? ∠WTZ

m<3 = 65°. Write 65° in the picture and use it to answer the following questions. DO NOT use a protractor!

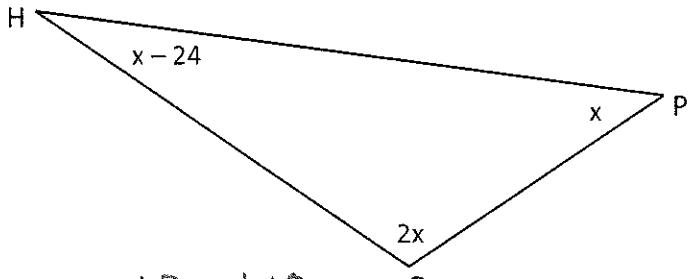
g) What is m<1 ? 90°

h) What is m<2 ? $\begin{array}{r} 8 \\ 9\not{0} \\ -65 \\ \hline 25 \end{array}$ 25°

i) What is m<4 ? $\begin{array}{r} 1 \\ 180 \\ -65 \\ \hline 115 \end{array}$ 115°

j) What is m<5 ? 65°

18)Find "x" and the missing angles.



$x - 24 + x + 2x = 180$

$4x - 24 = 180$

$+24 \quad +24$

$\frac{4x}{4} = \frac{204}{4}$

$x = 51$

51-24

2(51)

x = 51°

m<H = 27°

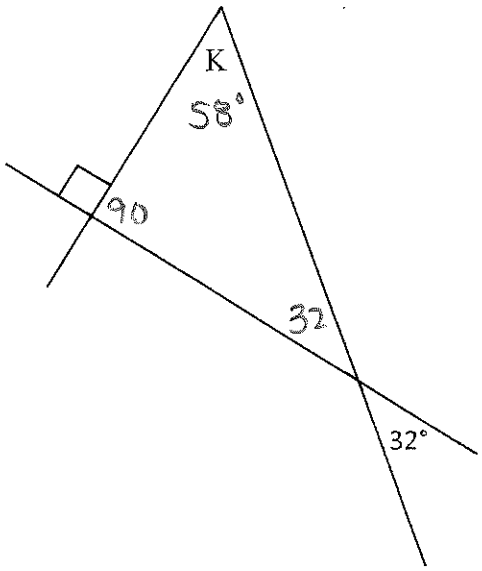
m<O = 102°

m<P = 51°

19)Using the picture to the right, find m<K

90 + 32 = 122

180 − 122 = 58

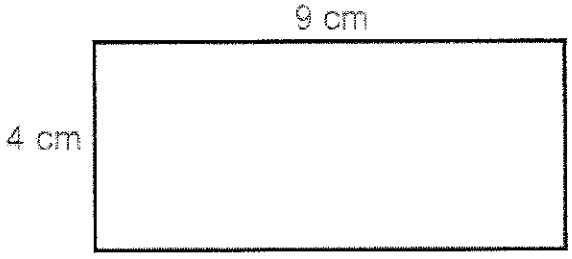


20) Find the area of and perimeter of the rectangle below...

Area = $l \cdot w$

$4 \cdot 9$

36 cm²

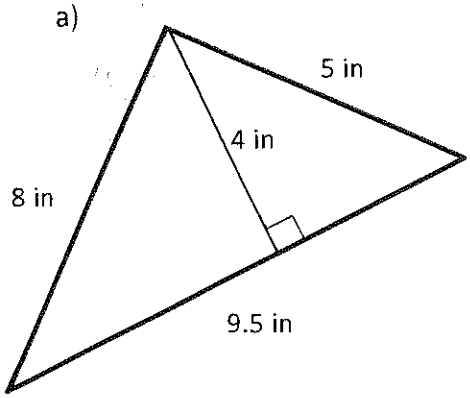


Perimeter =

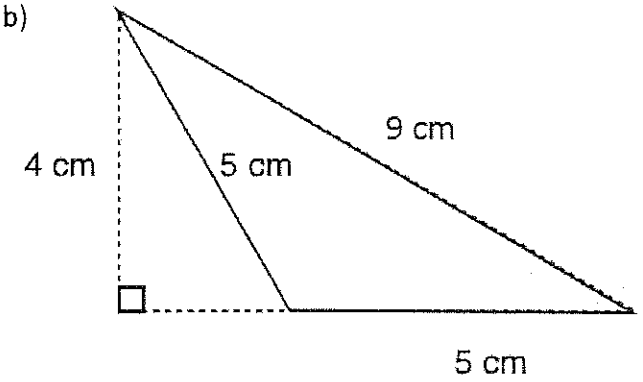
4 + 4 + 9 + 9 = 26 cm

21)Find the area and perimeter of the following triangles.

a)



b)



AREA

$\frac{1}{2} b \cdot h$

$\frac{1}{2} \cdot 9.5 \cdot 4$

$19\ in^2$

PERIMETER

$8+5+9.5$

$22.5 in$

AREA

$\frac{1}{2} \cdot 5 \cdot 4$

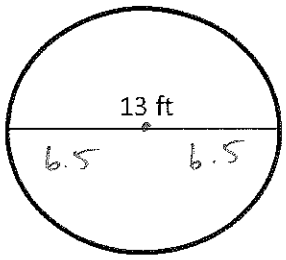
$10\ cm^2$

PERIMETER

$5+5+9$

$19\ cm$

22)Find the area and circumference of the circle.



AREA: πr^2

$3.14 \cdot 6.5^2$

$3.14 \cdot 6.5 \cdot 6.5 = 132.665\ ft^2$

CIRCUMFERENCE:

$\pi \cdot d$

$3.14 \cdot 13 = 40.82\ ft$

23) If a circle has a circumference of 64 inches, what would the diameter be?

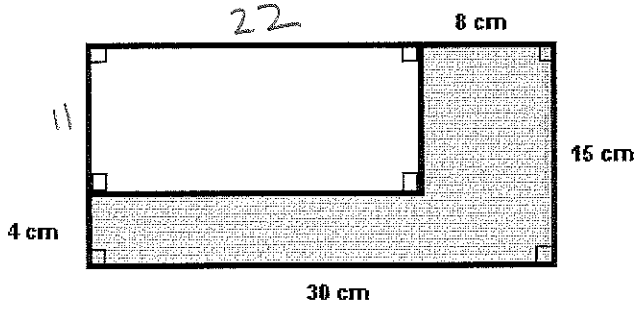
$C = \pi \cdot d$

$\frac{64}{3.14} = \frac{3.14 \cdot d}{3.14}$

$20.38\ in = d$

24)Find the area of the shaded region in each figure below...

a.

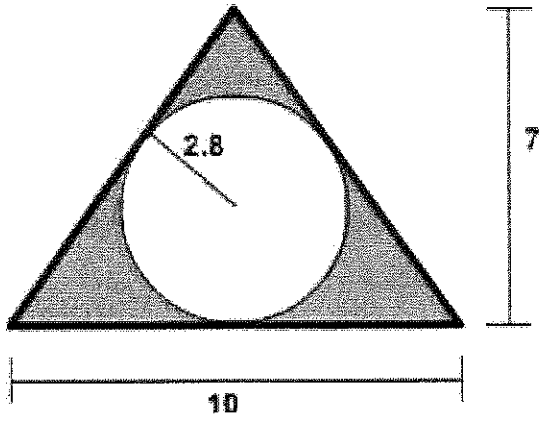


BIG
$30 \cdot 15$
450

SMALL
$11 \cdot 22$
242

$450 - 242 = 208\ cm^2$

b.

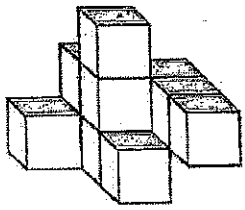


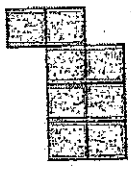
Triangle
$\frac{1}{2} \cdot b \cdot h$
$\frac{1}{2} \cdot 10 \cdot 7$
35

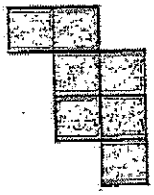
Circle
$\pi \cdot r^2$
$3.14 \cdot 2.8^2$
$3.14 \cdot 2.8 \cdot 2.8$
24.6176

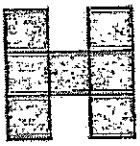
$35 - 24.6176 = 10.38\ units^2$

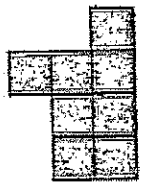
25) Which drawing represents the top view of this drawing?



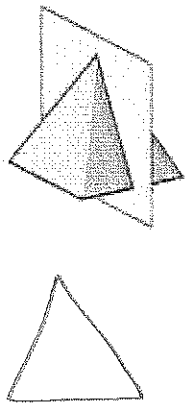
a) 

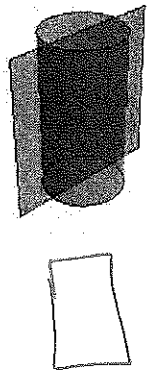
b) 

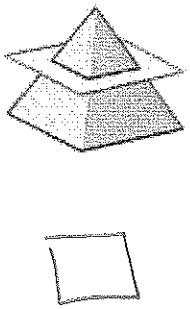
c) 

d) 

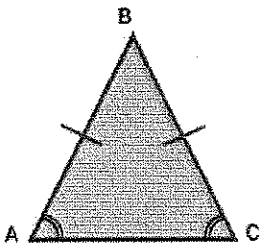
26) Sketch the shape made by each cross section below...

a. 

b. 

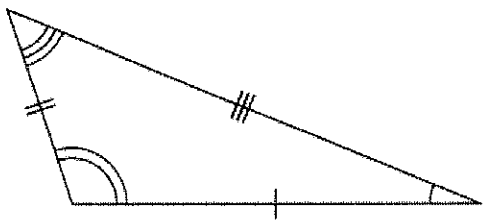
c. 

27) Give each triangle below two names (one based on angles and one based on side lengths).

a. 

acute (angles)

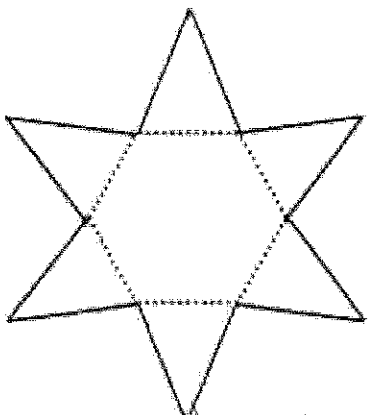
isosceles (side lengths)

b. 

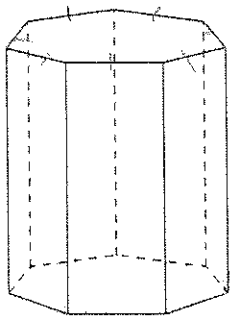
obtuse (angles)

scalene (side lengths)

28)Name the following figures

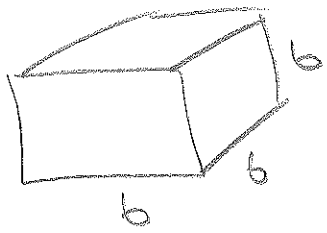
a) 

hexagonal pyramid

b) 

heptagonal prism

29) Find the surface area of a cube where each edge is 6 cm.



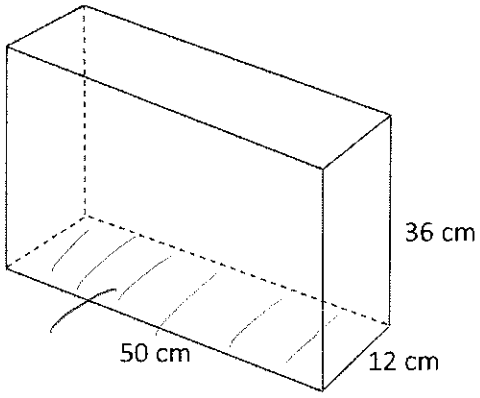
6x6 = 36

6 faces

36 x 6 = 216 cm²

30) Find the **surface area** AND **volume** of the following shapes. Show all of your work and include units with your answer!

a)



SURFACE AREA:

TB: $50 \cdot 12 = 600$, $600 \cdot 2 = 1200\ cm^2$

LR: $12 \cdot 36 = 432$, $432 \cdot 2 = 864\ cm^2$

FB: $50 \cdot 36 = 1800$, $1800 \cdot 2 = 3600\ cm^2$

$1200 + 864 + 3600 = 5664\ cm^2$

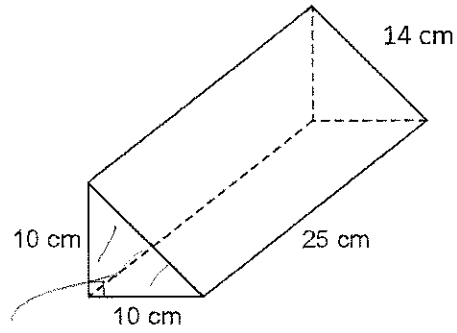
VOLUME:

$V = A\ of\ B \cdot h$

$V = 600 \cdot 36$

$V = 21{,}600\ cm^3$

b)



SURFACE AREA:

2 tri: $\frac{1}{2} b \cdot h$, $\frac{1}{2} \cdot 10 \cdot 10 = 50$

3 rect: $l \cdot w = 10 \cdot 25 = 250$, $l \cdot w = 10 \cdot 25 = 250$, $l \cdot w = 14 \cdot 25 = 350$

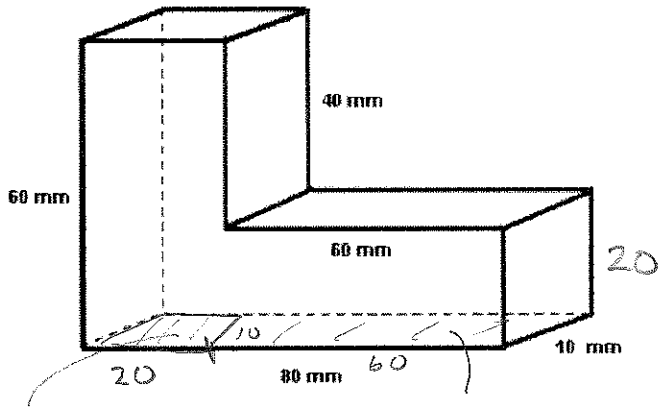
$50 + 50 + 250 + 250 + 350 = 950\ cm^2$

VOLUME:

$V = A\ of\ B \cdot h$

$V = 50 \cdot 25 = 1250\ cm^3$

31) Find the volume of the figure below...



Tall: $V = A\ of\ B \cdot h$, $V = 200 \cdot 60$, $V = 12{,}000$

Short: $V = A\ of\ B \cdot h$, $V = 600 \cdot 20$, $V = 12{,}000$

$12{,}000 + 12{,}000$

$24{,}000\ mm^3$

$20 \cdot 10 = 200$

$60 \cdot 10 = 600$

32) In the diagram, how much GREATER is the...

a. **area** of box B than the **area** of box A?

$2^2 = 2 \cdot 2 =$ 4 times

b. **volume** of box B than the **volume** of box A?

$2^3 = 2 \cdot 2 \cdot 2 =$ 8 times