Grade 11
Essential Mathematics

$

8 m

5 m

6 m

Girl Shoe Sizes - 100 Girl Sample

Count or Frequency

25
20
15
10
5
0

7 13 18 20 18 13 7 4

4 5 6 7 8 9 10 11
Shoe Size
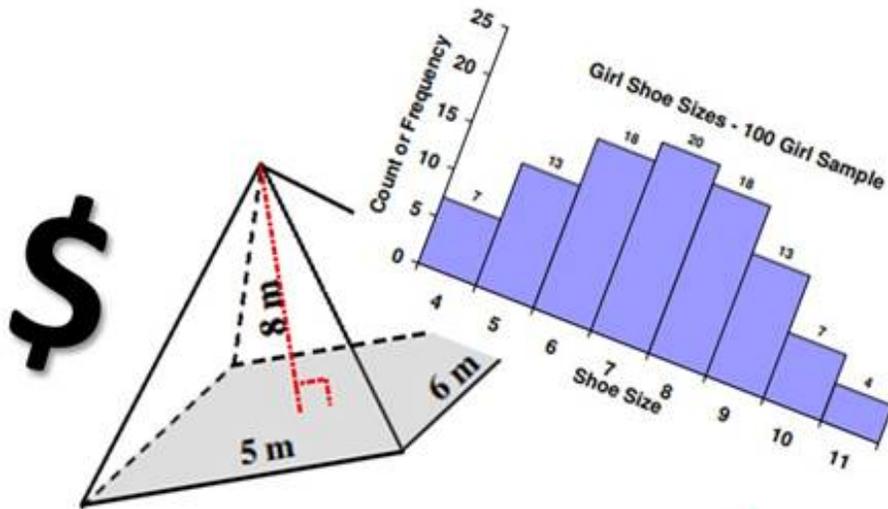
Quiz Debrief
Week 4
23-02-16

GRADE 11 ESSENTIALS MATH
Week 4 Quiz

Name:_____

Date: _____

CLOSED BOOK. Use yours and my Cheat sheet, Geometry Formulae Sheets, and Loan Tables

Max Time 45 Mins. Each individual question is worth 2 marks unless otherwise indicated.

Show work! Round all decimal answers to the nearest 0.01 as usual

** Do QUESTION 1 or Question 2, not both. If you do both I will mark the better answer **

1. Determine the Surface Area of the entire Cylinder.
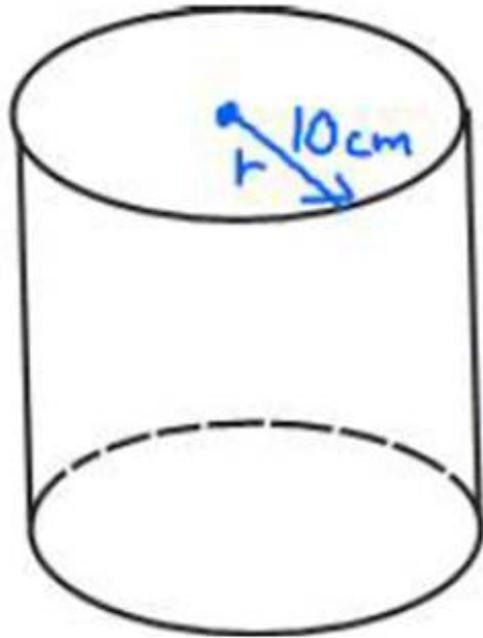
$$SA_{cyl} = 2\pi r^2 + 2\pi rh \quad \text{Write the formula}$$

$$= 2\cdot\pi\cdot 10^2 + 2\cdot\pi\cdot 10\cdot 16 \quad \text{Plug in numbers}$$

$$= \boxed{\begin{array}{c} 2*\pi*10^2+2*\pi*10*1 \\ 6 \\ \hline 1633.62818 \end{array}}$$

$$SA = \boxed{1633.63} \ cm^2$$

$$= \uparrow$$

Square cm

r 10cm

h = 16cm

Cylinder

(Two congruent circles connected with a rectangle wrapped around circumference)

r

h
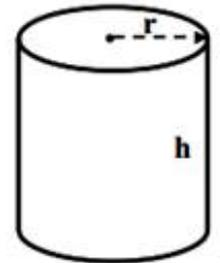
Surface Area; SA   lateral side   top & bottom

$SA = 2\pi r^2 + 2\pi rh$ tube

Volume; V:

$V = Base_{area} * h$
$\quad = A * h$
$\quad = \pi r^2 h$

Rectangular Pyramid or Square Pyramid

(A rectangle connected to an apex point by triangles on its edges)

h_{object} l_{base} W_{base}

caution the pyramid has a height, and the triangular faces each have a height
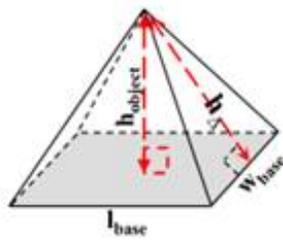
Surface Area; SA

SA = add up area of all the faces (Base area plus four triangles)

Volume; V:

$V = \dfrac{1}{3} * Base_{area} * h_{pyramid}$
$\quad = \dfrac{1}{3} * (l * w) * h_{pyramid}$

2. Determine the Surface area of this Square Pyramid:

Surface Area ; add area of faces

Bottom:
$$(5m \cdot 5m) = 25m^2$$

4 Triangles
$$4 \cdot (\tfrac{1}{2} \cdot b \cdot h)$$
$$= 4 \cdot (\tfrac{1}{2} \cdot 5 \cdot 4) = 40m^2$$

$$Total = \boxed{65m^2}$$

Surface Area on outside of the pyramid

4m

5m   5m

5m

Net:

$\tfrac{b}{5}$ $\tfrac{4}{h}$

5

MrF
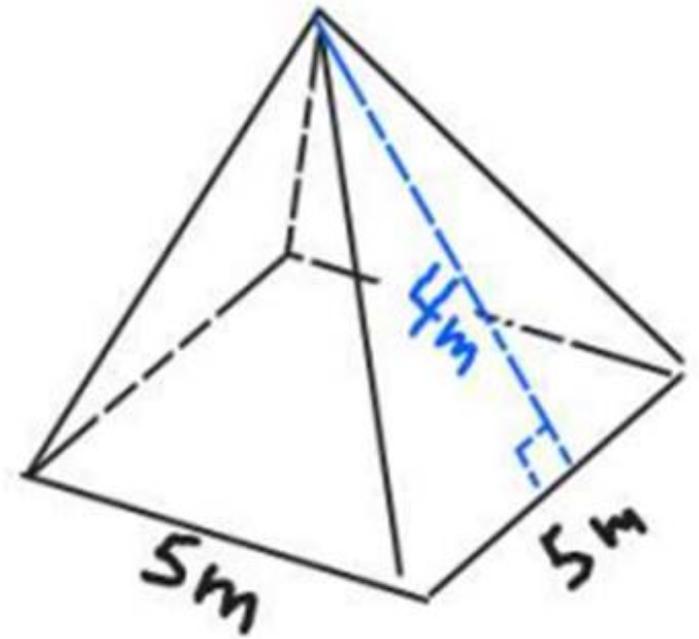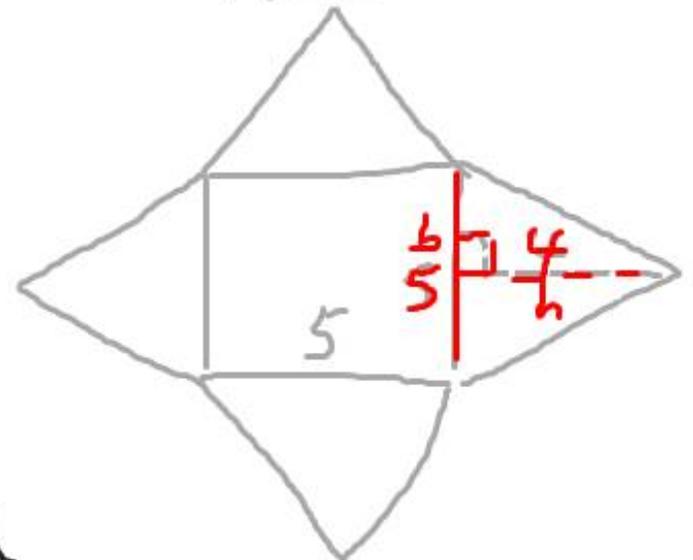
3. Complete the Simple Interest Table: [1 mark each blank]

	A [$]	I [$]	P [$]	R [%/yr]	T [yr]
a)	?	?	$3,000	6%	ooops ← missing
b)	$1,400	400	1,000	5%	8 years
c)	1200	300	$900	10%	3.33 yr

Work Area:

a) $I = P \cdot r \cdot t$

$I = 3000 \cdot 6/100 \cdot t$ No can solve! missing info!

$$\begin{array}{r} A\ 1200 \\ -P\ 900 \\ \hline I\ 300 \end{array}$$

b) $I = P \cdot r \cdot t$

$400 = P \cdot 5/100 \cdot 8$

$400 = P \cdot 0.4$

$\dfrac{400}{0.4} = \dfrac{P \cdot 0.4}{0.4}$

$P = \dfrac{400}{0.4} = \$1000$

$A = P + I = 1000 + 400 = \$1,400$

c) $I = P \cdot r \cdot t$

$300 = 900 \cdot 10/100 \cdot t$

$\dfrac{300}{90} = \dfrac{90 \cdot t}{90}$

$3.33\ yr = t$

4. John invests \$6,400 in an investment that pays 7.5% interest compounding monthly. $\longrightarrow$ 12 times per year!

   a. Determine the value of his investment after 8 years.

   b. Determine how much interest he will have earned

a) $A = P \cdot \left(1 + \frac{r}{s}\right)^{n \cdot s}$ Write formula

$A = 6,400 \cdot \left(1 + \frac{0.075}{12}\right)^{(8 \cdot 12)}$ ← Plug in numbers

$A = 6\,400 \cdot \left(1 + \frac{0.075}{12}\right)^{(8 \cdot 12)}$

A $= 11639.805894$

$A = \$11{,}639.81$

b) $A = P + I$

$11{,}639.81 = 6{,}400 + I$

$-6{,}400.00 \qquad\qquad -6400$

$5{,}239.81 = I$

John made \$5,239.81 Interest

5. If 8 bananas cost $5, determine how much 12 bananas cost.

x

MrF

$$\text{\$} \quad 0 \qquad \text{\$5} \quad \text{\$}x \quad \text{\$}10 \qquad \text{\$}15 \cdots$$

Bananas

$$0 \qquad 8 \qquad 16 \qquad 24 \cdots$$

12
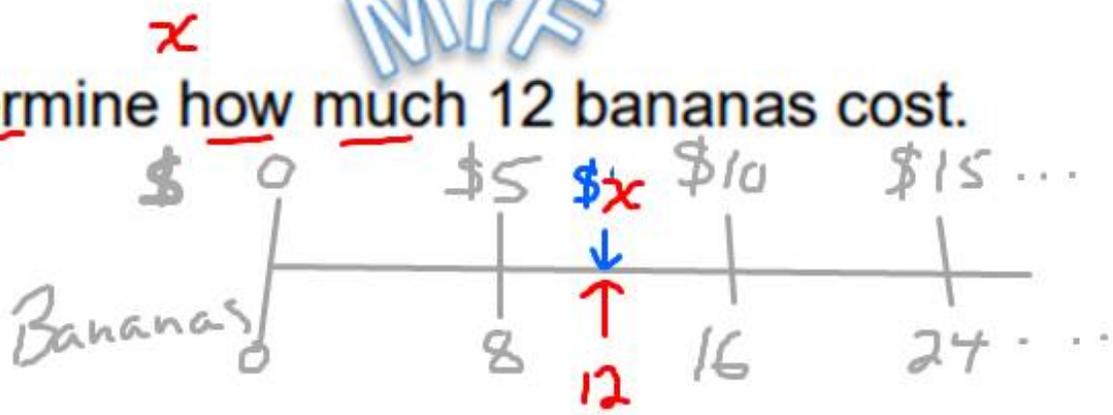
Do you try other representations of a problem?

Organize your thoughts?

$$\frac{\$5}{8 \text{ bananas}} = \frac{\$x}{12 \text{ bananas}}$$

$$\frac{\$5}{8 \text{ bananas}} = \frac{\$x}{12 \text{ bananas}}$$

Cross multiply to solve the proportion

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

$$\frac{60}{8} = x$$

$$x = \$7.5$$

So 12 bananas will cost $7.50

6. Determine the volume of a fish tank [rectangular prism] that is 30 cm high, 40 cm wide, and 70 cm in length.

Draw it?

$$Vol_{prism} = \underset{area}{Base} \cdot h \, prism$$

Rectangle

$$= (l \cdot w) \cdot h$$

$$= 70 \, cm \cdot 40 \, cm \cdot 30 \, cm$$

$$= \boxed{84000 \, cm^3}$$
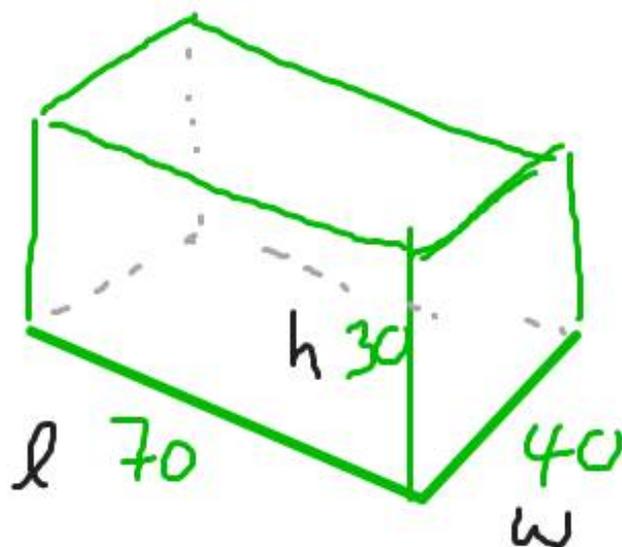
$$= 84,000 \, ml$$

$$= 84 \, litres$$

FYI

h 30

l 70

40
w

BONUSES (1 mark each if you need them)

1. Determine the Volume of the Cylinder

$$Vol = Base_{area} \cdot h$$

$$= \pi r^2 \cdot h$$

$$= \pi \cdot (10cm)^2 \cdot 16cm^1$$

$$= 5{,}026.55 \ cm^3$$

cubic centimetres

(ie: ml)

10cm

r

h =

16cm
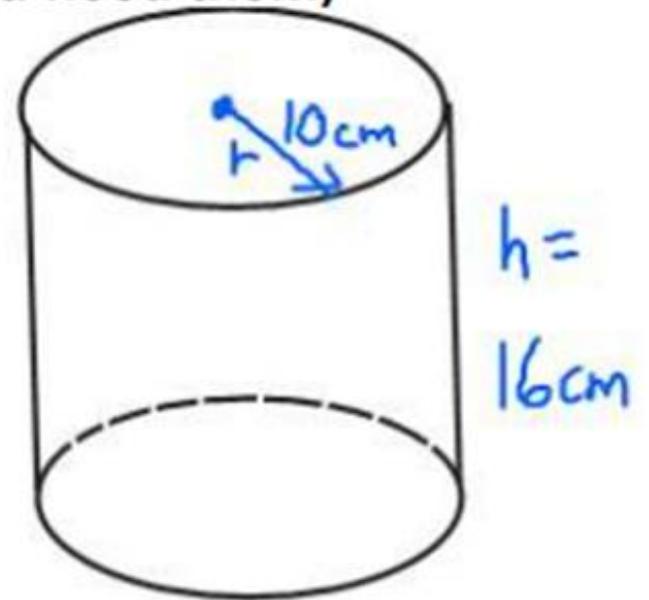
2. Solve the following proportions

a) $\frac{3}{8} = \frac{x}{20}$ b) $\frac{4}{9} = \frac{30}{x}$

a) $\frac{3}{8} \longleftarrow \frac{x}{20}$ b) $\frac{4}{9} \diagdown \frac{30}{x}$ ← unknown in bottom

$\frac{3 \cdot 20}{8} = x$

$\frac{60}{8} = x$

$\boxed{x = 7.5}$

Really:

$20 \cdot \frac{3}{8} = \frac{x}{20} \cdot 20$

$\frac{60}{8} = x$

$4 \cdot x = 9 \cdot 30$

$4 \cdot x = 270$

$x = 270/4 = \boxed{67.5}$

Secret! Flip!

$\frac{9}{4} \diagdown \frac{x}{30}$

$67.5 = \frac{270}{4} = x$

3. Determine the volume of the cone:

$$V = \frac{1}{3} \cdot Base_{area} \cdot height$$

$$= \frac{1}{3} \cdot \overset{circle}{(\pi r^2)} \cdot h$$

$$= \frac{1}{3} \cdot \pi \cdot 4^2 \cdot 6$$

$$= \boxed{100.53 \ in^3}$$ cubic inches

8in

6in

r = 4

Cylinder
B·h

cone
$\frac{1}{3} \cdot B \cdot h$
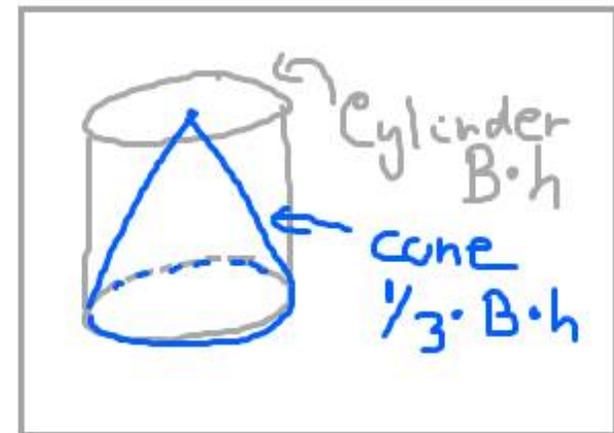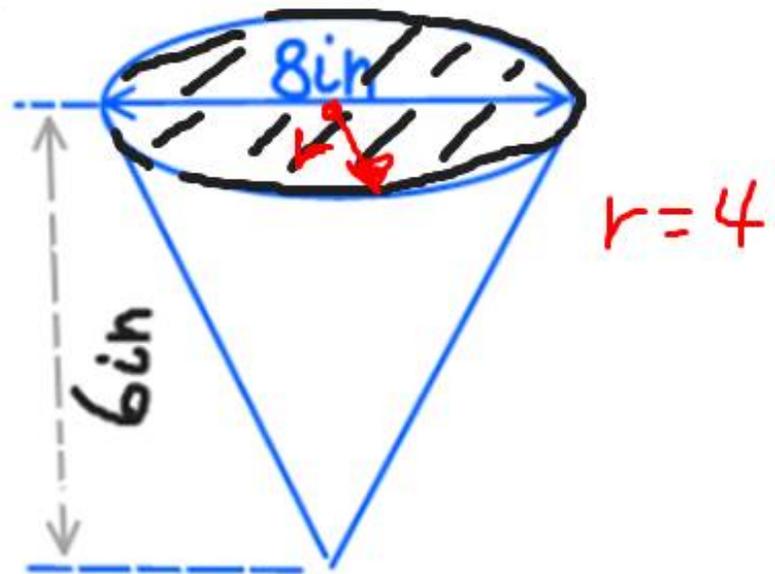
4. LOAN. Kevin borrows $12,000 from the bank at 8% interest rate for 5 years.

   a. Determine his monthly payment $243.36

   b. How much does Kevin end up paying total by the end of the loan

a) $\frac{\$20.28}{\$1,000} \cdot \$12,000 = \$243.36$ the monthly payment

b) $\frac{\$243.36}{month} \cdot 60$ months

$= \boxed{\$14,601.60}$ Total Paid
   for his $12,000 loan

$5yr \cdot \frac{12\ month}{1\ yr}$

$= 60\ months$

MONTHLY LOAN PAYMENT TABLE _FOR A LOAN OF $1,000_ !!

Annual Rate	1 Year Monthly	2 Years Monthly	3 Years Monthly	4 Years Monthly	5 Years Monthly
2%	$84.24	$42.54	$28.64	$21.70	$17.53
3%	$84.69	$42.98	$29.08	$22.13	$17.97
4%	$85.15	$43.42	$29.52	$22.58	$18.42
5%	$85.61	$43.87	$29.97	$23.03	$18.87
6%	$86.07	$44.32	$30.42	$23.49	$19.33
7%	$86.53	$44.77	$30.88	$23.95	$19.80
8%	$86.99	$45.23	$31.34	$24.41	$20.28
9%	$87.45	$45.68	$31.80	$24.89	$20.76
10%	$87.92	$46.14	$32.27	$25.36	$21.25

Awesome