Review for FINALS

FINAL TASK #1 date_____

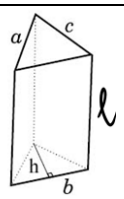
FINAL TASK #2 date_____

Success Criteria

- ☐ Students on IEP – if you will need more time to finish, arrange a ride afterschool on these days (or finish over your lunch that same day)
- ☐ You must come to class on the dates above. If you miss any of these days, you must give a doctor's note in order to do the evaluation on another day.
- ☐ Ensure your Survival Guides are complete and corrected. These you may use on PART #1 (but not on PART #2)
- ☐ Complete this Review booklet. Check your answers with the file online: www.mrsk.ca

Date	pg	Topics	Done?	Corrected?
		Finish and correct your SURVIVAL GUIDES		
	2-3	Polynomials		
	4-5	Quadratics		
	6-7	Trigonometry		
	8-10	Measurement		
	11-14	EXTRA practice		
		ANSWERS – go online to see		

FORMULAS GIVEN ON PART #2:

QUADRATIC RELATIONS	$y=ax^2+bx+c$	$y=a(x-r)(x-t)$	$y=a(x-h)^2+k$
PYTHAGOREAN THEOREM	$c^2=a^2+b^2$		
PRIMARY TRIG RATIOS	$\tan\theta=\frac{opposite}{adjacent}$	$\sin\theta=\frac{opposite}{hypotenuse}$	$\cos\theta=\frac{adjacent}{hypotenuse}$
VOLUME	Rectangular Prism $V=lwh$	Cylinder $V=\pi r^2 h$	Square Base Pyramid $V=\frac{b^2h}{3}$
	Triangular Prism $V=\frac{bh}{2}l$	Cone $V=\frac{\pi r^2 h}{3}$	Sphere $V=\frac{4\pi r^3}{3}$
SURFACE AREA	Rectangular Prism $SA=2lw+2wh+2lh$	Cylinder $SA=2\pi r^2+2\pi rh$	Square Base Pyramid $SA=b^2+2bl$
	Triangular Prism $SA=bh+al+bl+cl$		

Polynomials

Things to know:

- Expand – FOIL
- Factor – Common/Sum and Product/Difference of Squares

1. Common Factor

a. $3x^2+12x+18$ b. $12x^2+6x+21$ c. $15x^2-25x+35$

d. $4x^2+14x$ e. $-20x^2+15$ f. $-48x^2-27x$

2. Factor by Sum and Product

a. $x^2+7x+10$ b. x^2-6x+9 c. $x^2+4x-12$

3. Factor by Difference of Squares

a. x^2-4 b. $81-x^2$ c. $4x^2-25$

4. Factor Completely

a. $4x^2+12x-40$ b. $3x^2+18x+27$ c. $2x^2+16x+18$

d. $3x^2-27$ e. $-5x^2+20$ f. x^3-16x

5. Expand and simplify

a. $(x+2)(x+5)$ b. $(2x+3)(3x-4)$

c. $(3-x)(4x+5)$ d. $(4x-1)^2$

6. Expand and simplify

a. $(2-3x)(4+x)$ b. $(6x-4)^2$ c. $(2p-7q)(2p-5q)$ d. $(2u-3v)^2$

7. Factor each of the following

a. $15p^3+21p^4$ b. $x^2-11x+30$ c. $16-81x^2$

d. $x^2 + 3x$ *e.* $y^2 + 15y + 56$ f. $25r^2 - 36s^2$

g. $2x^2 + 10x$ *h.* $x^2 - x - 72$ i. $144r^2 - 49s^2$

8. Find the dimensions of each rectangle

a)

$A = 21x^2 + 3x$

b)

$A = x^2 - 4x - 5$

Quadratics

Things to know:

- Quadratic/Linear/Neither
  - Tables
  - Equations
- Vocabulary & how to properly record answers for
  - Zeros/x-int
  - Y-int
  - Vertex
  - Axis of Symmetry
  - Optimal Value (Max or Min)
- Standard/Factored/Vertex Forms
  - Characteristics
  - Graph
  - Word Problems

1. Identify whether each equation or table given is linear, quadratic or neither. Explain why.

a. $y = 3 + 5x$

b. $y = -4x^2 + 7x$

c.

x	y
−3	0
−2	7
−1	12
0	15
1	16
2	15

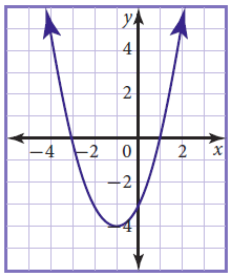
d.

x	y
0	2
1	4
2	6
3	4
4	2
5	1

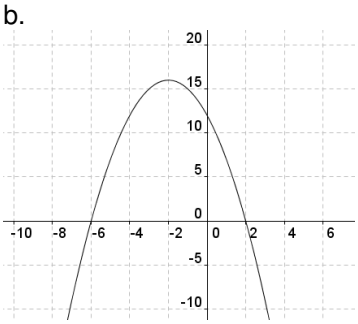
2. Identify all the key features of the following graphs

	a.	b.	c.	d.
Max or Min ?				
Optimal Value				
Axis of symm				
Vertex				
Zeros/x-int				
Y-intercept				

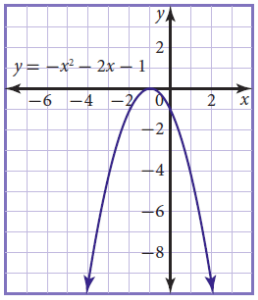
a.



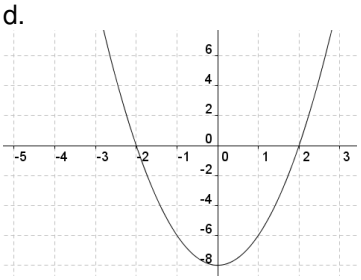
b.



c.



d.



3. Identify what form each equation is in (factored, standard, vertex?).

a. y= $x^2 - 2x - 35$

b. y= $(x - 1)^2 - 36$

c. y= $0.5x^2 + 5.0x + 12.5$

d. y= $2(x - 2) \cdot (x + 2)$

e. y= $(x - 7)(x + 5)$

f. y= $-x^2 - 4.0x + 12.0$

g. y= $\frac{1}{2} \cdot (x + 5.0)^2$

h. y= $2x^2 - 8$

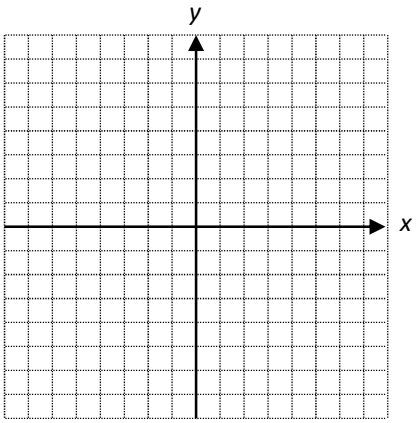
4. Sketch quadratics

a) y= $2(x-2)\cdot(x+2)$
form?

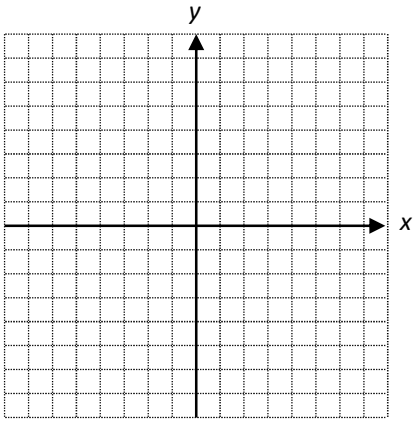
b) $y=-2(x-3)^2+18$
form?

c) $y=-0.2x^2+1.6x+1.8$
factor to get zeros

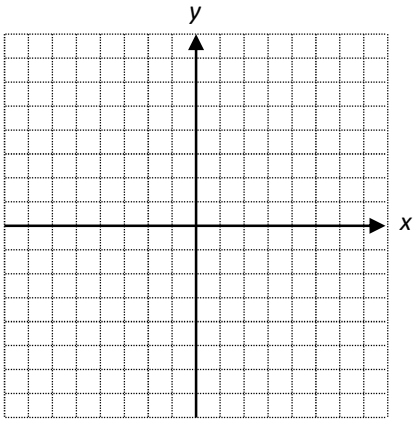
x	y
2	
-2	



x	y
4	
2	



x	y=
9	
-1	



5. If the above parabola represents a hanging cable with
y=height of the cable from support poles and
x=horizontal distance from the centre, both in meters

a. what is the minimum height of the cable?

b. how wide apart are the support poles?

6. If the above parabola represents the shape of a door to a cathedral with
y=height in feet, and
x=horizontal distance also in feet.

a. what is the maximum height of the door?

b. what is the width of the door at its base? (hint find zeros by subbing y=0 and solving for x)

7. If the above parabola represents profit made for selling ice-cream with
y=profit in thousands of dollars and
x=quantity of ice-cream sold also in thousands.

a. what is the maximum profit?

b. what is the quantity of ice-cream sold to reach this maximum profit?

c. what is the quantity of ice-cream sold to have zero profit?

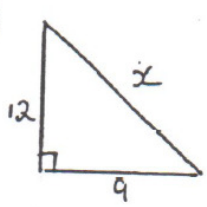
Trigonometry

Things to know:

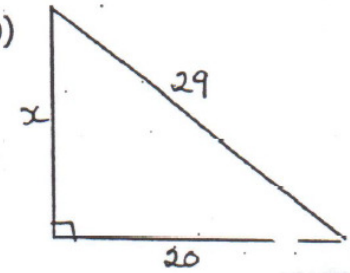
- Pythagorean Theorem
- SOH CAH TOA
  - Solve for sides
  - Solve for angles
- Word Problems
  - Angles of Elevation & Depression

1. Solve for the missing side

a)

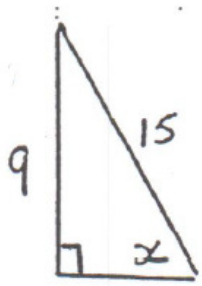


b)

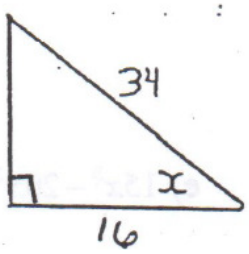


2. Solve for the missing side or angle

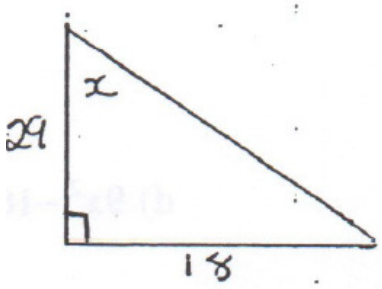
a.



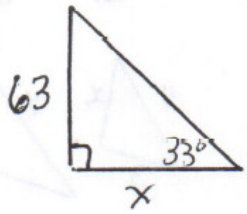
b.



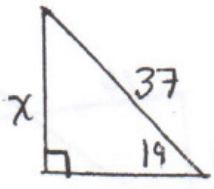
c.



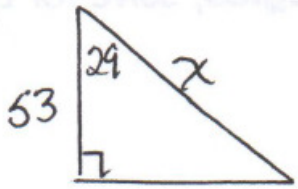
d.



e.

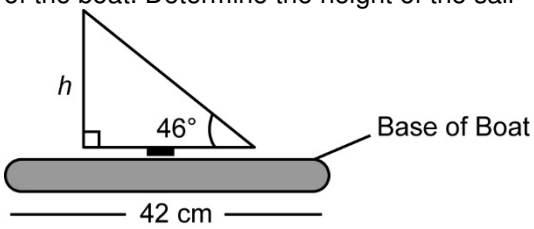


f.



3. Draw △MNO with ON=8cm, MN = 6 cm, and MO = 6 cm. Use Pythagorean Theorem to verify if it's a right triangle.

4. Vince's model boat has a base 42 cm long. The horizontal length of the sail is half the length of the base of the boat. Determine the height of the sail



5.
A ladder is placed against a building. If the ladder makes an angle of 72° with the ground and the foot of the ladder is 2.8 m from the base of the building, find how long the ladder is. Draw and label the diagram.

6.
To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. Calculate how many meters would be SAVED if it were possible to walk through the pond.

7.
Tonya is standing 17 m from the base of a tower. She measures the angle of elevation to the top of a tower to be 33°. What is the height of the tower, to the nearest metre?

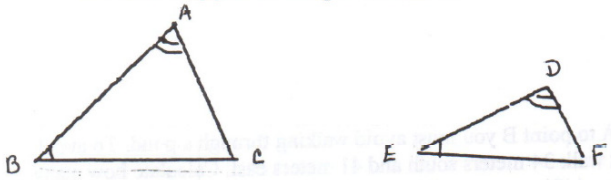
8.
A forest ranger is in a fire tower 120 ft above the ground. She sights a fire at an angle of depression of 3°. How far is the fire from the base of the tower, to the nearest foot?

Measurement

Things to know:

- Similar Triangles
- Imperial and Metric System Conversions
- Volume and Surface Area

1. The following pair of triangles are similar



a) ΔBCA is similar to Δ_____ b) Side EF corresponds to side _____

c) Side AC corresponds to _____ d) Angle C corresponds to angle _____

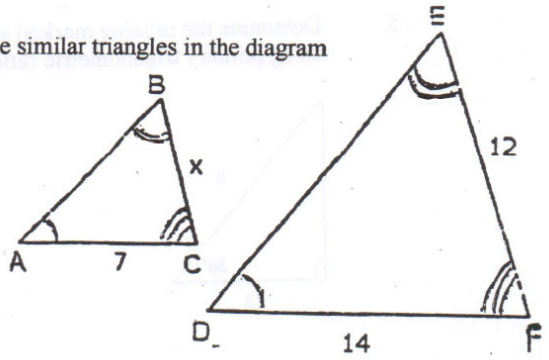
e) Angle B corresponds to _____

2. Determine the value of the missing side on the similar triangles in the diagram

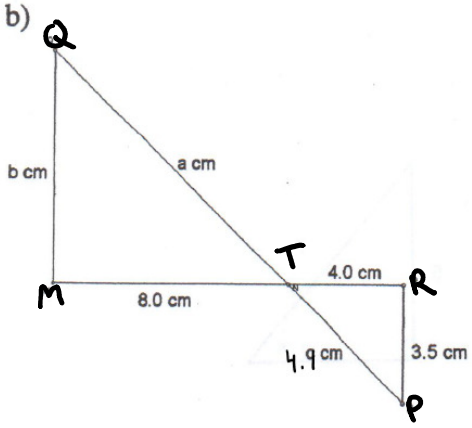
a)

Δ_____ $\sim$ Δ_____

_____ = _____ = _____



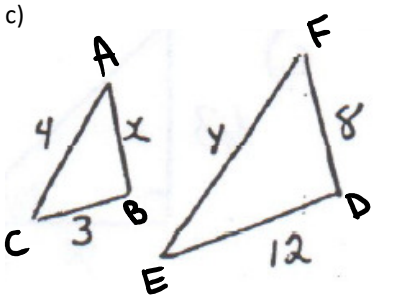
b)



Δ_____ $\sim$ Δ_____

_____ = _____ = _____

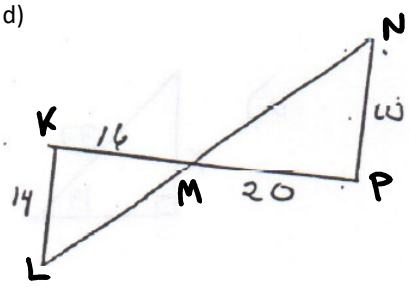
c)



Δ_____ $\sim$ Δ_____

_____ = _____ = _____

d)



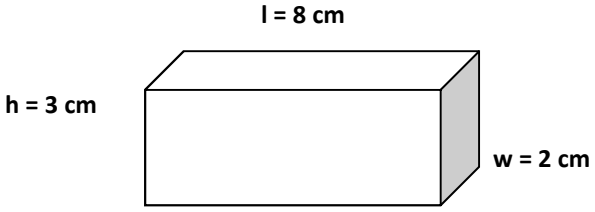
Δ_____ $\sim$ Δ_____

_____ = _____ = _____

3.
At a certain time of the day, the shadow of a 1.5 meter boy is 5 meters long. The shadow of a tree at this same time is 9 meters. Draw a diagram and find how tall the tree is.

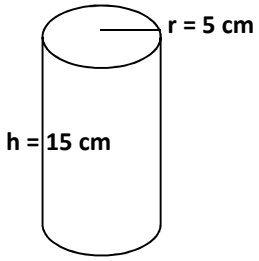
4.
Two trees of different heights cast shadows on a sunny day. One tree is 8 m tall and casts shadow that is 2.5 m long. How tall is the other tree if it casts a 3 m shadow.

5. Draw the net (unfolded flat version) of this prism and label the dimensions.



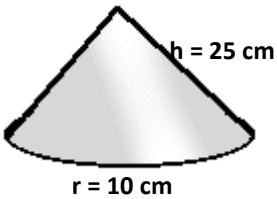
6. Find the **surface area** of the prism in question 5.

7. Find the **surface area** of the cylinder below

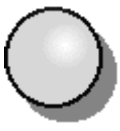


8. Find the **volume** of the cylinder

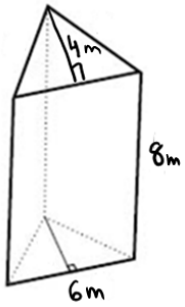
9. Find the **volume** of the cone below



10. Find the **volume** of the sphere below



11. For the triangular prism



a. What is the volume of the prism? Use units in your answer!

b. Draw the net (unfolded flat version) of this tent and label the dimensions.

c. Find the slanted length of the triangular part.

d. How much material was used to make the prism? USE units in your answer!

e. Convert your answer to centimetres squared. (100cm=1m)

12. Convert the following

a. 12 km = _____ m

b. 9.5 g = _____ kg

c. 0.04 L = _____ mL

d. 29 sq. yd. = _____ sq. ft.

e. 36 in = _____ cm

f. 75 km = _____ mi

	Length	Mass	Volume
between imperial + metric	30.48 cm = 1 foot 2.54 cm = 1 inch 1.6 km = 1 mile	28.35 g = 1 ounce 0.454 kg = 1 pound 0.907 t = 1 ton (US) 454 g = 1 pound	15 mL = 1 tbsp 29.574 mL = 1 fluid ounce 0.473 L = 1 pint 3.785 L = 1 gallon 1L = 4 cups
within metric	10 mm = 1 cm 100 cm = 1 m 1000 m = 1 km	1000 g = 1 kg 1000 kg = 1 t	1000 mL = 1 L
within imperial	12 in = 1 ft 3 ft = 1 yard 1760 yd = 1 mile	16oz = 1lb 2000 lb = 1ton	16 tbsp = 1cup 16 fl oz = 1 pint 2 pints = 1 quart 8 pints = 1 gallon

Temperature

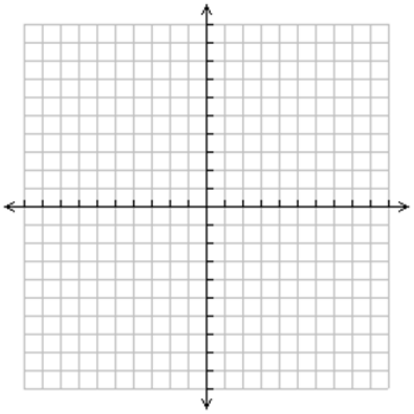
$^{o}F = 1.8C + 32$

$^{o}C = \frac{5}{9}(F - 32)$

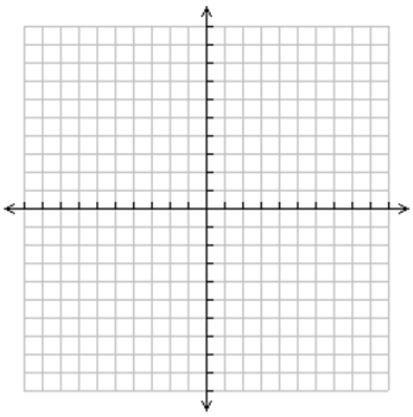
EXTRA Practice

1. Draw the following parabolas based on description provided

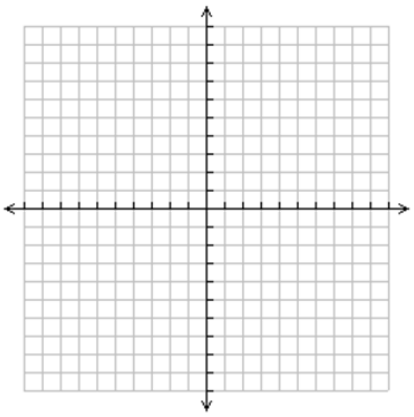
a. Draw the parabola with vertex of (-2, 4) and zeros at -1 and -3.



b. Draw the parabola with a minimum value of 2, no zeros and a y-intercept of 8.

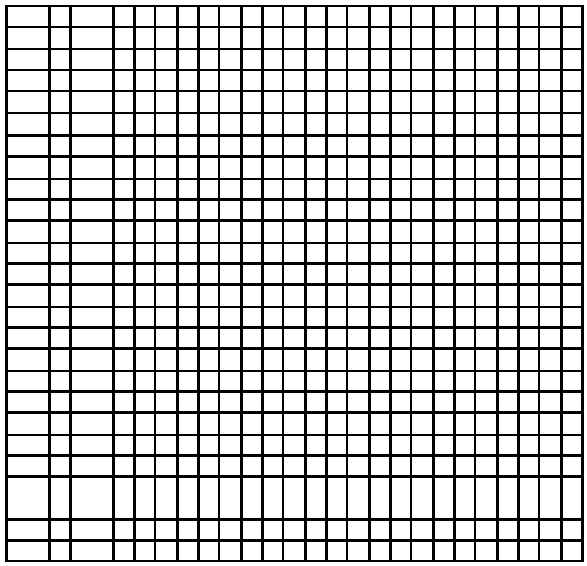


c. Draw the parabola with a zero at (2, 0) the vertex at (3, -4) and a y-intercept of (0, 12)



2. a. Complete the **difference table** below and then **graph** the data.

x	y	1st differences	2nd differences
-4	-2		
-3	1		
-2	2		
-1	1		
0	-2		
1	-7		



b. Explain how the difference table helps you predict what the graph will look like.

c. Identify the following for the parabola

Vertex? Axis of Symmetry? Optimal Value? Max or Min?

3. Expand and simplify

a. $(-2t - r)(-3t + r)$ b. $(5q - 8r)^2$

4. Factor each of the following

a. $3x^2 - 6x$ *b.* $d^2 - 12d + 35$ c. $121x^2 - 9y^2$

5. For the quadratic $y = -2(x-4)(x+6)$ calculate the following

a. the *y*-intercept
(hint sub x=0)

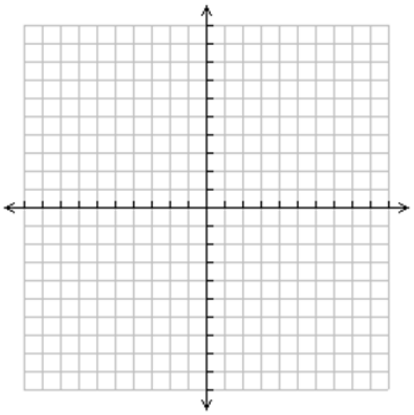
b. the zeros

c. the axis of symmetry
(hint in middle of zeros)

d. the optimal value
(hint the y-value of the axis of symm #)

e. vertex
(hint put axis of symmetry and optimal value together)

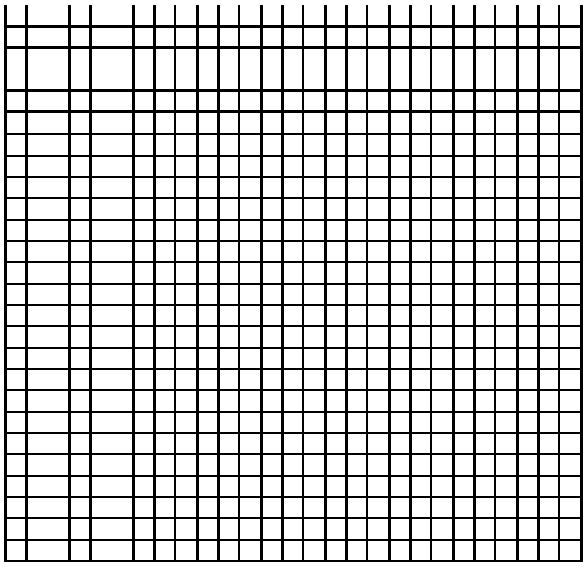
f. sketch
label vertex, zeros and y-int



6. Mark is a competitive diver. The time taken for him to surface from the bottom of the pool can be modelled by the relation $d = 0.15t^2 - 15$, where d represents Mark's depth in metres, and t represents time in seconds.

a. Graph this relation using a table of values.

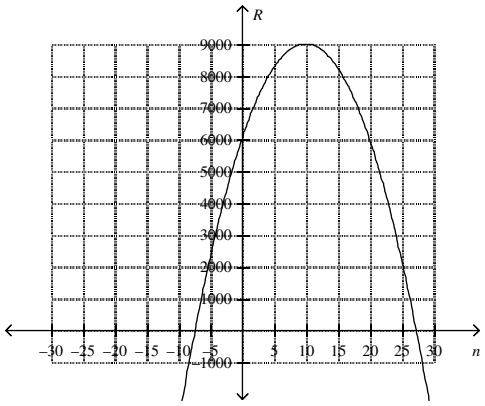
t	$d = 0.15t^2 - 15$
-10	
-5	
0	
5	
10	



b. How deep is the pool?

c. How long does it take mark to reach the surface?

7. The circus sells tickets for $6. The circus owners want to increase their revenues, so they increase prices. They have noticed that ticket sales decrease by 60 tickets every time the price increases by $0.60. The situation can be modelled by the relation $R = -30n^2 + 600n + 6000$ which is represented in the following graph. R represents revenue in dollars and n represents the number of times the price is increased by $0.60.



a. Use the graph to determine the original revenue if no adjustments are made to the n. (ie. n=0)

b. Use the graph to find the maximum revenue.

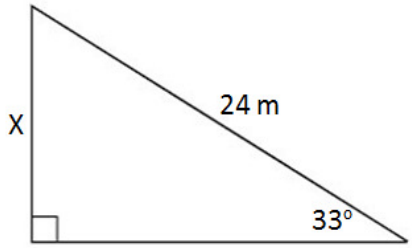
c. Use the graph to find how many times does the ticket price have to be increased to reach the maximum revenue?

d. Use the underlined information in the question to find what is the ticket price that results in the maximum revenue?

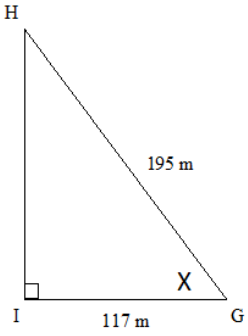
e. Use the equation to find what is the Revenue if n=15

8. Determine the measure of the missing angles or sides in each of the following diagrams using the **primary trigonometric ratios**.

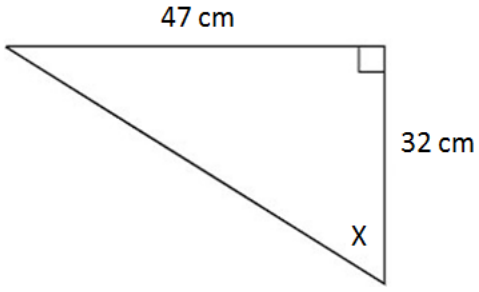
a.



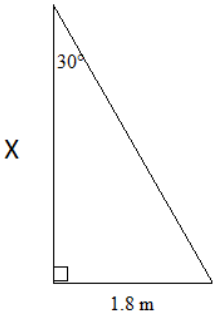
b.



c.

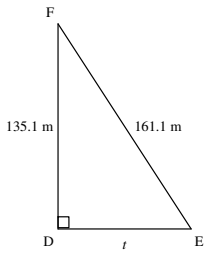


d.

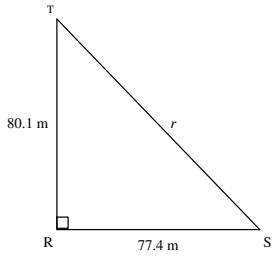


9. Use the Pythagorean Theorem to solve for the indicated side

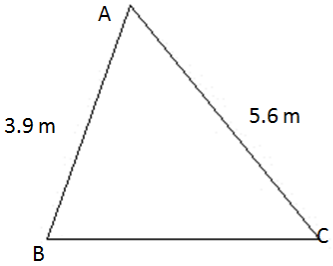
a.

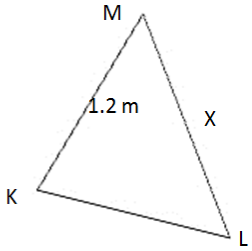


b.



10. For the **similar triangles** in the diagram





a. State the similarity statement and ratio of sides

△ ____ ~ △ ____

____ = ____ = ____

b. Find x.

11. Find the surface area and volume of a cylinder given its radius is 10 inches and height is 20 inches.

12. Find the volume of a rectangular prism given its dimensions: height 9 cm, length 12 cm and width 4.5 cm.

13. Convert

a) 26 km = _____mi b) 5 quarts = _____L c) 58 inches = ____yrds

	Length	Mass	Volume
between imperial + metric	30.48 cm = 1 foot 2.54 cm = 1 inch 1.6 km = 1 mile	28.35 g = 1 ounce 0.454 kg = 1 pound 0.907 t = 1 ton (US) 454 g = 1 pound	15 mL = 1 tbsp 29.574 mL = 1 fluid ounce 0.473 L = 1 pint 3.785 L = 1 gallon 1L = 4 cups
within metric	10 mm = 1 cm 100 cm = 1 m 1000 m = 1 km	1000 g = 1 kg 1000 kg = 1 t	1000 mL = 1 L
within imperial	12 in = 1 ft 3 ft = 1 yard 1760 yd = 1 mile	16oz = 1lb 2000 lb = 1ton	16 tbsp = 1cup 16 fl oz = 1 pint 2 pints = 1 quart 8 pints = 1 gallon

Temperature

$°F = 1.8C + 32$

$°C = \frac{5}{9}(F - 32)$