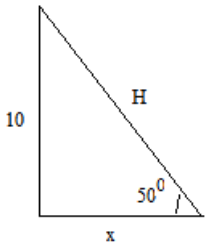
First name: _____ Last name:_____

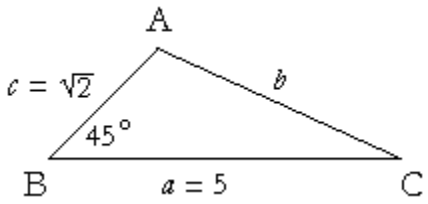
Review Questions in class

Trigonometry

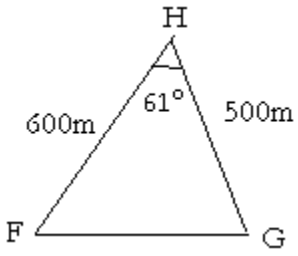
1. Find x and H in the right triangle below.



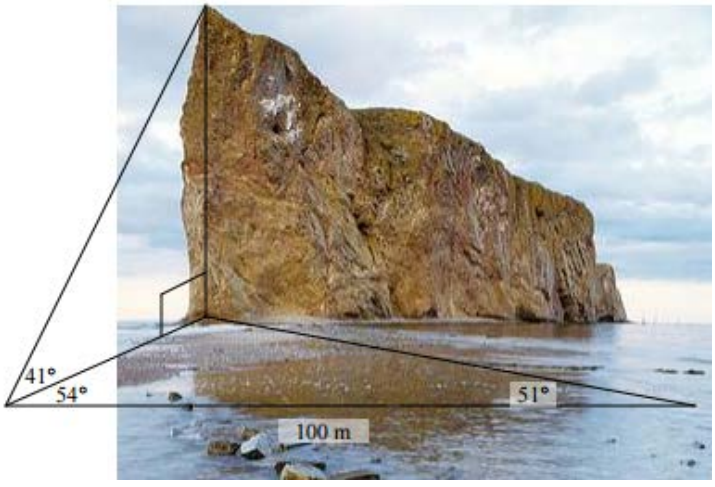
2. In the oblique triangle ABC, find side *b* if side $a = 5$ cm, $c = \sqrt{2}$ cm, and they include and angle of 45°.



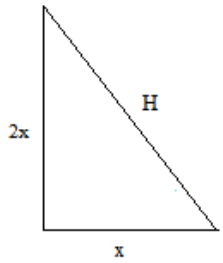
3. The span of a bridge is the distance between its supports. A helicopter is hovering above the longest span of the Ambassador Bridge, which connects Windsor and Detroit. The distances to the ends of the longest span and the angle between the lines of sight are as shown. What is the length of the longest span of the bridge, FG, to the nearest ten meters?



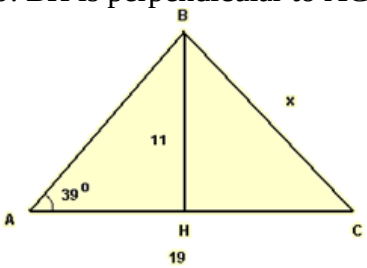
4. Perce Rock is a popular tourist attraction on the shore of the Gaspe Peninsula. To find its height, measurements were taken at low tide, as shown in the diagram. What is the height of Perce Rock, to the nearest meter?



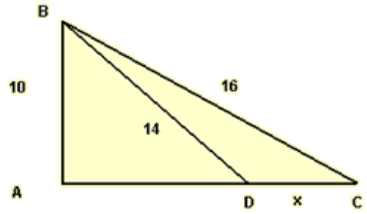
8. Find the lengths of all sides of the right triangle below if its area is 400.



9. BH is perpendicular to AC. Find x the length of BC.



10. ABC is a right triangle with a right angle at A. Find x the length of DC.



Extra Review Questions

1. Expand and simplify the following.

a) $(x + 5)(x - 2)$ b) $(m - 2)^2$ c) $3(x + 3)(x + 2)$ d) $-(a - 1)(a + 7)$

2. Factor completely.

a) $4m^2 - 28m$ b) $3ab - 9ab + 6a^2b$ c) $x^2 - 7x + 12$ d) $a^2 + 4a - 21$

e) $y^2 + 9y + 20$ f) $t^2 - 6t - 27$ g) $x^2 + 6xy + 5y^2$ h) $m^2 - 9mn + 14n^2$

i) $4t^2 - 28t + 40$ j) $1 - 36m^2$ k) $36t^2 - 49s^2$ l) $4t^2 - 4t + 1$

m) $4m^2 + 20m + 25$ n) $9t - 4t^3$ o) $x^3 - 4x^2 + 4x$ p) $5y^4 + 10y^2 - 15$

q) $x^2 - (3y+4)^2$ r) $y^4 - 81$

3. Solve by factoring. Clearly state your solution.

a) $x^2 + 4x = 0$ b) $k^2 - 36 = 0$ c) $p^2 + 4p - 12 = 0$ d) $12x^2 + 17x = 5$

4. Solve using the quadratic formula. Round to 2 decimal places if necessary.

a) $x^2 - 4x - 1 = 0$ b) $-5x^2 + 8x - 10 = 0$ c) $x^2 + 5x - 8 = 0$

d) $m^2 - 5m + 3 = 0$ e) $x^2 - 12x + 35 = 0$

5. Find the zeroes of the following quadratic functions.
a) $y = (x - 1)(x + 4)$ b) $y = -(2x + 1)(5x - 9)$ c) $y = x(x + 10)$

d) $y = x^2 - 8x - 20$ e) $y = -4x^2 + 20x$ f) $y = -2x^2 + 14x + 36$

6. For d and e in question 5 above, find the co-ordinates of the vertex and sketch.

7. Express the following equations in standard form.
a) $y = 2(x + 1)(x - 3)$ b) $y = -(x + 5)(2x + 1)$ c) $y = (x - 4)^2 + 5$ d) $y = 3(x + 2)^2 - 10$

8. Find the equations of the following quadratic functions in factored form.
a) zeroes: 2 and -5 and passes through (-1, - 48)
b) zeroes: - 7 and 8 and has y-intercept 56.

9. Find the equation of each of the following quadratic functions in vertex form.
a) vertex is (- 8, - 3) and passes through (- 4, 13)
b) vertex is (2, 4) and passes through (3, - 1)

10. Without sketching, state the direction of the opening, the co-ordinates of the vertex, the equation of the axis of symmetry and the maximum or minimum value.
a) $y = -\frac{1}{2}x^2 + 1$ b) $y = (x + 3)^2 + 2$ c) $y = 5(x - 3)^2 - 7$

11. Express the following equations to vertex form, then sketch.
a) $y = x^2 - 4x + 1$ b) $y = -x^2 - 6x + 1$ c) $y = 3x^2 - 6x - 8$

12. The height of a golf ball after being hit is described by the function $h = -5t^2 + 20t$, where h metres is the height, t seconds after the ball has been hit.
a) what is the maximum height of the ball?
b) how many seconds after impact is the maximum height reached?
c) when does the ball hit the ground?

13. A guy wire reaches 7m up a telephone pole. It makes an angle of $57°$ with the ground. How long is the wire?

14. A plane climbs at an angle of $39°$ through a distance of 12 km. What altitude does it reach?

15. From a point A, the angle of elevation to the top of a tree is $58°$. The distance from point A to the top of the tree is 90m. At point B, the angle of elevation to the top of the same tree is $75°$. What is the distance between points A and B?

16. Three towns, A, B and C form a triangle. Towns A and B are 200km apart. Angle CAB = $50°$ and angle ABC = $64°$. Determine the distance between town A and C and the distance between towns B and C.

17. Classify the quadrilateral with vertices P(2,3) Q(5, -1) R(10, -1) and S(7,3).

18. Determine the equation of the following circles:
a) centre (0,0) and radius 4 b) centre (0,0) and through (3,4)

19. Determine whether the following points are in, on, or outside the circle $x^2 + y^2 = 100$.
a) (-6, 8) b) (10, 10) c) (1, - 9)

20. Put the following equation in vertex form by completing the square $y = -3x^2 + 24x - 11$

21. Given the fact that a parabola's vertex is at (7, 14) and it also passes through the point (5, 6), determine its equation in **Standard Form** and in **Vertex Form**. Place the equation in **Factored Form** as well if possible. If it is not possible, state which case exists: The parabola has **no** zeros OR two **irrational** zeros.

22. Solve the following equation $0 = 3x^2 - 7x - 13$.

23. Use the Discriminant to find how many zeros the following relation has: $y = 3x^2 + 5x + 10$

24. Caleb hits a baseball. After t seconds, its height h, in metres, is $h = -5t^2 + 20t + 0.8$
a. How high off the ground is the ball when it is hit?
b. What is the height of the ball after 2 seconds?
c. Use the method of completing the square to find the maximum height of the ball.
d. How long did it take for it to hit the ground?

25. William has a flower garden that is 14 m wide and 18 metres long. He wants to build a concrete walkway around the garden that is of uniform width. If his goal is to have the walkway's total area to be equal to one-quarter of original area of the flower bed, what should the width of the walkway be?

26. Find the equation of the parabola that goes through (4, 6) and having zeros of 2 and -8.

27. Use finite differences to determine whether each function is linear, quadratic, or neither.

a)

x	y
0	7
1	9
2	15
3	25

b)

x	y
2	- 5
4	- 11
6	- 17
8	- 23

28. The endpoints of a line segment are A(-4, 3) and B(5, -2). Calculate:
a) the length of AB b) the midpoint of AB c) the slope of AB

29. Triangle PQR has vertices P(4, - 3) Q(- 2, -7) and R (- 4, - 4)
a) Classify the triangle as scalene, isosceles or equilateral. Show all work.
b) Is triangle DEF a right-angled triangle? Prove your answer.
c) Calculate the perimeter of PQR, to the nearest tenth.

30. Line segment AB has endpoints A(3, -7) and B(-9, -5). Find the equation of the perpendicular bisector of AB.