

Name: _____

Date: _____

Pre-Calculus 11 – FINAL EXAM Review – Booklet 1

Chapters 7, 2, 3, and 4

***** Do this work on your own lined paper AND graph paper *****

Chapter 7 – Trigonometry

1) Sketch and solve the following right triangles to the nearest tenth:

a) $\angle C = 90^\circ$, $a = 9m$, $b = 7m$

b) In **oblique** $\triangle ABC$, $\angle B = 38.2^\circ$, $\angle C = 65.6^\circ$, and side $b = 54m$.

c) In **oblique** $\triangle GHK$, $\angle G = 67^\circ$, side $k = 9.5cm$, and side $h = 4.9cm$.

2) At the Cedar Hill Golf Course in Victoria, BC, the shortest distance from the tee box to the hole is 348 yards on the 5th hole. On his first shot, Golfy McGolferson drives the ball so that it lands 195 yards from the tee. However, he slices the ball so that the line connecting the tee and the ball makes an angle of 12° with the line connecting the tee and the hole. After his first shot, how far is the ball from the hole (to the nearest yard)?

3) Draw each angle in standard position, **identify the quadrant in which it lies**, and state each reference angle.

a) 205°

b) 310°

4) Draw the $45 - 45 - 90^\circ$ triangle and the $30 - 60 - 90^\circ$ triangle.

5) Suppose you have a standard angle of 30° and the initial arm is 7.8cm. What is the length of the terminal arm to the nearest tenth?

6) Draw and explain the CAST rule.

7) Determine the **exact** values of: a) $\tan 45^\circ$ b) $\cos 120^\circ$ c) $\sin 330^\circ$

8) Suppose θ is an angle in standard position with terminal arm in quadrant II, and $\cos \theta = \frac{-5}{9}$. Determine the **exact** value of $\tan \theta$.

9) Find the values of $\sin \theta$, $\cos \theta$, and $\tan \theta$ for the quadrantal angle 270° .

10) Solve for θ . For each, $0^\circ \leq \theta \leq 360^\circ$.

a) $\cos \theta = \frac{-\sqrt{3}}{2}$

b) $\sin \theta = \frac{1}{\sqrt{2}}$

c) $\tan \theta = \frac{1}{\sqrt{3}}$

Chapter 2 – Quadratics

11) Graph the following and state the vertex, axis of symmetry equation, max/min, domain, and range.

a) $y = -2(x + 3)^2 + 5$

b) $y + 7 = \frac{1}{2}(x - 4)^2$

12) Write an equation for a parabola with vertex (4, -2) that passes through the point (7, -29).

13) Complete the square to change the function from standard to vertex form. Then state the vertex, axis of symmetry equation, max/min, domain, and range.

a) $y = x^2 - 4x - 1$

b) $y = 3x^2 - 12x + 11$

c) $y = 5x - 3x^2$ (in fraction form)

14) Mary stands on the top of a building and throws a ball upwards. The ball travels according to the equation $h = -16t^2 + 384t + 50$, where h is the height of the ball off the ground in meters at t seconds after it was thrown.

a) How far is the ball above the ground just when she throws it?

b) What is the highest vertical point that the ball reaches?

c) How long does it take for the ball to reach this highest vertical point?

d) After how many seconds does the ball hit the ground?

15) A rancher has 800m of fencing to enclose a rectangular cattle pen along a riverbank. No fencing is required along the riverbank. Find the dimensions that would maximize the area for the cattle to graze. Also, what is the maximum area?

Chapter 3 – Quadratic Equations

16) Solve (find the roots) by **graphing**: $x^2 + 2x = 3$

17) Solve by **factoring**. a) $x^2 - 35 = -2x$

b) $2x^2 + 11x + 5 = 0$

c) $2x^2 - 32 = 0$

d) $2x(x - 2) + x(x + 1) = 0$

e) ~~$4(x + 3)^2 + 10(x + 3) + 4 = 0$~~ (OMIT e)

f) $\frac{1}{2}x^2 - 2x - 30 = 0$

18) Write a quadratic equation whose roots are $\frac{-2}{3}$ and $\frac{4}{5}$

19) The takeoff board for a long jump has an area of 2440cm^2 . The length of the board is 102cm greater than the width. Find the dimensions of the board by factoring.

20) Solve by completing the square.

a) $x^2 - 6x - 27 = 0$

b) $x^2 + 8x + 11 = 0$

c) $3x^2 + 4x = 2$

21) A picture that measures 10cm by 5cm is to be framed. The width between the picture and the frame is the same on all sides of the picture. The total area inside the frame (picture and empty space) is to be three times the area of the picture. What is the width between the picture and the frame? Use **completing the square** or **quadratic formula** to solve the problem.

22) Describe how the discriminant can be useful.

23) Solve each using the quadratic formula.

a) $5x^2 - 4 = 8x$

b) $3x^2 - 4x - 2 = 0$

24) Josie's rectangular garden measures 9m by 13m. She wants to double the area of her garden by adding equal lengths to both dimensions. Determine this length to the nearest hundredth of a meter. Use the **quadratic formula** to solve the problem.

TURN OVER!

Chapter 4 – Systems of Equations and Inequalities

25) What are the possible number of solutions that a linear-quadratic system can have? What about a quadratic-quadratic system?

26) Solve the system by **graphing**. $y = x^2 - 4x + 8$ and $2x + y = 7$

27) Solve the system by **graphing**. $x^2 + y - 3 = 0$ and $x^2 - y + 1 = 0$

28) Solve the system **algebraically**. $x^2 - y + 5 = 3$ and $4x = 14 - y$

29) Solve the system **algebraically**. $3x^2 - x - y - 2 = 0$ and $6x^2 + 4x - y = 4$

30) A golfer hits a drive up the hill on #12 at Gorge Vale Golf Club (the dreaded “Cemetery Hole”). The hill has a slope of $\frac{1}{6}$. The trajectory of the golf ball is given by $y = -0.002x^2 + 0.5x$, where y is the height of the ball and x is the horizontal distance of the ball from the tee (in yards). What are the landing coordinates of the golf ball? Round answers to the nearest yard.

31) Solve the inequalities by **graphing**.

a) $3x - y > -3$ b) $2x + 5y \leq 20$

32) The volunteers who are organizing a grad reunion meeting have up to \$90 to spend on pizza for lunch. They need to order at least 6 large pizzas for the group. The choices are cheese pizza for \$12 each or pepperoni for \$15 each. Write a system of inequalities that describes this system, and then solve the system by graphing.

33) Solve by graphing, and graph the solution on a number line.

a) $x^2 - x \leq 12$ b) $2x^2 - 5x - 3 > 0$

34) Solve the inequality by graphing. $y < -2x^2 + 4x + 3$

35) The average cost in dollars of producing x units of math textbooks in an hour is $2x^2 - 13x + 53$. Determine the number of textbooks to produce each hour to keep the cost **below** \$60 per book.