

Honors Final Exam Review (Unit 4-6)

Name Key

UNIT 4

1. Find the measure of arcs BC and AC.

$4x + 3x + 26 = 180$
 $7x = 154$
 $x = 22$
 $BC = 4(22) = 88^\circ$
 $CA = 180 - 88 = 92^\circ$

2. Find the measure of angle BAC.

$\frac{132}{2} = 66^\circ$

3. Find x.

$3(x+3) = 4(11)$
 $3x+9 = 44$
 $3x = 35$
 $x = \frac{35}{3}$

5. Find x.

$5(x) = 6(10)$
 $5x = 60$
 $x = 12$

7. What is the volume of the cone in terms of pi?

$\frac{\pi(7)^2 \cdot 14}{3}$
 718.4 in^3

9. The spokes of a bicycle wheel form 13 congruent sections. The diameter of the wheel is 700 mm. What is the area of the wheel between four consecutive spokes?

$r = \frac{700}{2} = 350$

$AOS = \frac{\pi(350)^2 \cdot 3}{13}$
 $= 38810.4 \text{ mm}^2$

4. Find the area and arc length of the shaded region.

$AL = \frac{2\pi(6)}{4} = 3\pi \text{ units}$
 $AOS = \frac{\pi(6)^2 \cdot 1}{4} = 9\pi \text{ units}^2$
 $90/360 = 1/4$

6. Weston has two round balloons. One balloon has a radius that is 3 times the radius of the other balloon. How much more air will the larger balloon need than the smaller balloon?

$SF = (3)^3 = 27 \text{ times more air}$

8. The top of a water tower is a perfect sphere and holds 1,436.76 cubic meters of water. What is the radius of the water tower to the nearest whole number?

$\frac{1436.76}{\frac{4}{3}\pi} = r^3$
 $\frac{3}{4} \cdot \frac{457.33}{1} = r^3$
 $r^3 = 343$
 $r = 7$

10. What is the volume of a cylinder with a diameter of 12 inches and a height of 36 inches?

$\pi(6)^2 \cdot 36 = 4071.5 \text{ in}^3$

UNIT 5

- 1) If a line segment needs to be partition by a 2:5 ratio, what is the fraction that would be used in the formula to find the point?

$$\frac{2}{2+5} = \frac{2}{7}$$

- 2) Find the midpoint of the segment given the points $A(4, -3)$ and $B(-11, 8)$.

$$\left(\frac{4-11}{2}, \frac{-3+8}{2} \right) = \left(-\frac{7}{2}, \frac{5}{2} \right)$$

Show/Explain how you know if the following lines are parallel, perpendicular or neither

- 3) $y = -\frac{3}{2}x - 10$ and $y = \frac{2}{3}x + 5$

\perp = negative reciprocals

- 4) $x - y = 10$ and $-2x + 5y = 6$

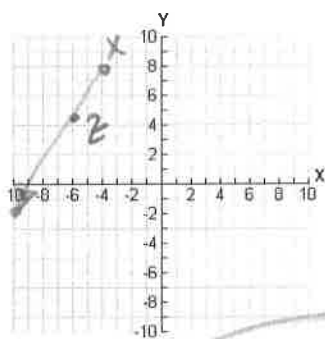
neither

$$\begin{aligned} -y &= -x + 10 \\ -1 & \\ y &= x - 10 \end{aligned}$$

$$\begin{aligned} 5y &= 2x + 6 \\ 5 & \\ y &= \frac{2}{5}x + \frac{6}{5} \end{aligned}$$

- 5) Find Point Z that partitions the directed line segment XY by $\frac{1}{3}$ from X, where $X(-4, 8)$ and $Y(-10, -2)$.

Graph.



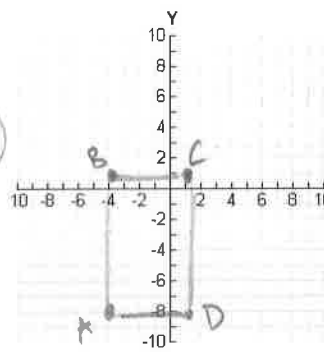
$$x = -4 + \frac{1}{3}(-6) = -6$$

$$y = 8 + \frac{1}{3}(-10) = \frac{14}{3}$$

$(-6, \frac{14}{3})$

$(-6, 4.67)$

- 6) ABCD has vertices at $A(-4, -8)$, $B(-4, 1)$, $C(1, 1)$. What point would D have to be for the figure to be a rectangle? Prove, mathematically, that this is a rectangle.



$D(1, -8)$

AD = BC 5 units
AB = DC 9 units
BC || AD
AB || DC

Also find the perimeter and area of the rectangle.

$$2(5) + 2(9) = 10 + 18$$

Perimeter = $\underline{28 \text{ units}}$ Area = $\underline{5 \times 9 = 45 \text{ units}^2}$

Use $3x^2 + 3y^2 - 36x + 24y + 9 = 0$ for questions 7-9.

- 7) Put into standard form, find center & radius in simplest form.

$$x^2 + y^2 - 12x + 8y + 3 = 0$$

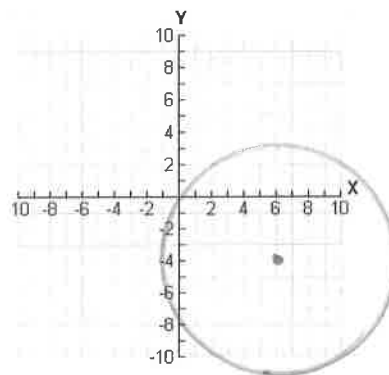
$$\begin{aligned} \frac{-12}{2} &= (-6)^2 & \frac{8}{2} &= (4)^2 & &= -3 \\ & & & & &+36 \\ & & & & &+16 \end{aligned}$$

$$(x-6)^2 + (y+4)^2 = 49$$

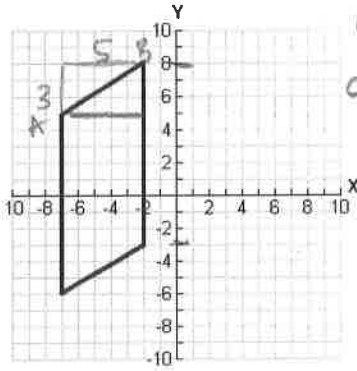
8) Center: $(6, -4)$

9) Radius: $\sqrt{49} = 7$

- 9) Now use a protractor to accurately graph.



10) Find the perimeter and area ($b \cdot h$) of the parallelogram below.

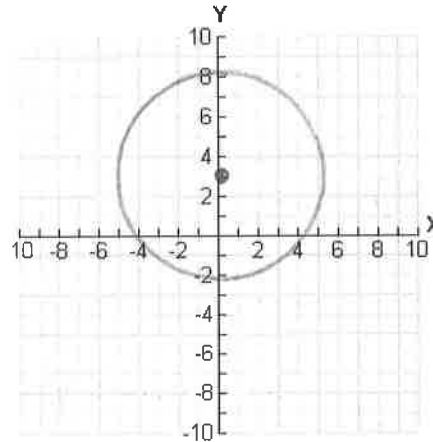


$h = 5$
 $d_{AB} = \sqrt{(3)^2 + (5)^2}$
 $= \sqrt{9 + 25}$
 $= \sqrt{34}$

$11 + 11 + \sqrt{34} + \sqrt{34}$

13) Graph $x^2 + (y - 3)^2 = 30$

$C: (0, 3) \quad r = 5.5$



11) Perimeter: $22 + 2\sqrt{34}$

12) Area: $11 \times 5 = 55 \text{ u}^2$

33.66 u

UNIT 6

The table shows the number of endangered and threatened animal species in the United States as of November 30, 1998.

	Mammals	Birds	Reptiles	Amphibians	Other
Endangered	59	75	14	9	198
Threatened	8	15	21	7	69

1) Find the probability that a listed animal is endangered given that it is a reptile.

35

$\frac{14}{35} = .40$ or 40%

Use the following table to answer 2-5.

On April 15, 1912, the Titanic struck an iceberg and rapidly sank with only 710 of her 2,204 passengers and crew surviving. Data on survival of passengers are summarized in the table below. (Data source: <http://www.encyclopedia-titanica.org/titanic-statistics.html>)

	Survived	Did not Survive	Total
First class passengers	201	123	324
Second class passengers	118	166	284
Third class passengers	181	528	709
Total passengers	500	817	1317

2) If one of the passengers is randomly selected, what is the probability that he/she was in first class?

$\frac{324}{1317} = .246$ 24.6%

3) If one of the passengers is randomly selected, what is the probability that this passenger survived?

$\frac{500}{1317} = .38$ 38%

4) If one of the passengers is randomly selected, what is the probability that this passenger was in first class and survived?

$\frac{201}{1317} = .153$ 15.3%

5) What is the probability that a randomly selected passenger survived, given that the passenger was in first class?

$\frac{201}{324} = .620$ 62%

Use the following to answer 6 & 7

Given $P(A) = .72$, $P(B) = .29$, and $P(A \cup B) = .8012$.

6) Find $P(A \cap B)$. $.72 \times .29$

- A. 0.2088 B. 0.5924
 B. 0.4076 D. 0.3837

$$.8012 = .72 + .29 - P(A \cap B)$$

$$P(A \cap B) = 1.01 - .8012 = .2088$$

7) Determine if A and B are independent events.

- A. Yes, because $P(A \cap B) = P(A) \times P(B)$
 B. Yes, because $P(A \cup B) = P(A) \times P(B)$
 C. No, because $P(A \cap B) \neq P(A) \times P(B)$
 D. No, because $P(A \cup B) \neq P(A) \times P(B)$

8) In a bowl of m & m's, there are 12 red ones, 6 green ones, and 15 blue ones. 33 TTL

a. If two m&m's are chosen at random **with replacement**, what is the probability of picking a red m&m and then, a blue m&m?

$$\frac{12}{33} \cdot \frac{15}{33} = \frac{180}{1089} = .165 = 16.5\%$$

b. If three m&m's are chosen at random **without replacement**, what is the probability that they all three are green ones?

$$\frac{6}{33} \cdot \frac{5}{32} \cdot \frac{4}{31} = \frac{120}{32736} = .0037 = .37\%$$

9) A person rolls two dice, one after the other. Find the probability of the following events.

a. $P(\text{sum of 7 or sum of 10})$

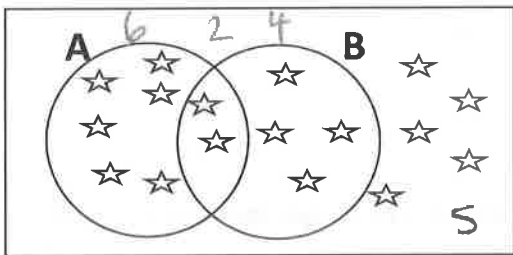
$$\frac{6}{36} + \frac{3}{36} = \frac{9}{36} = \frac{1}{4}$$

b. $P(\text{odd sum or sum more than 5})$

$$\frac{18}{36} + \frac{26}{36} - \frac{12}{36} = \frac{32}{36} = \frac{8}{9}$$

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

10) Given the Venn Diagram below with set A and set B determine the following:



17 TTL

a) $P(A) = \frac{8}{17}$

b) $P(A \cup B) = \frac{5}{17}$

c) $P(A \cap B) = \frac{2}{17}$

d) $P(A \cup B) = \frac{12}{17}$

e) $P(\bar{A} \cap B) = \frac{4}{17}$

f) $P(A \cap \bar{B}) = \frac{6}{17}$

Sum of A + B
but not A

Intersection of
A and B but
not B

OR similar to
only A.