Summer Packet in Preparation for Integrated Math 3 Honors
This outline serves as a guide for the development of a comprehensive summer packet designed to reinforce and build upon key concepts from Integrated Math II Honors, preparing students for the challenges of Integrated Math III Honors.

Section 1: Numeracy – Monomials, Radicals, Complex

Section 2: Algebraic Concepts
- Review of Quadratic Functions - forms, graphing
- Quadratic Expressions
    - Operations with quadratic functions
    - Factoring techniques (GCF, trinomials, difference of squares)
- Quadratic Expressions and Equations
    - Simplifying quadratic expressions
    - Multiplication and division of quadratic expressions
    - Solving quadratic equations

Section 3: Functions and Their Properties
- Function Properties, Notation and Evaluation
- Types of Functions - Linear, quadratic, exponential, and piecewise functions
- Inverses Functions - Finding and Verifying
- Transformations of Functions - Translations, reflections, and rotations

Section 3: Geometry and Measurement
- Pythagorean Theorem
- Perimeter and Area of geometric shapes
- Coordinate Geometry - Distance, midpoint, slope formulas
- Trigonometry Basics - sine, cosine, and tangent, Right triangle trigonometry

Section 4: Statistics and Probability
- Basic probability principles
- Compound events and probability

Section 5. Problem Solving Practice and Application

Section 1. Numeracy – Monomials, Radicals, Complex

1. Simplify the following expressions.

a. $5x-3x^2+15+11x^2-21x+8$

$8x^2-16x+23$

b. $\frac{2}{3}x+\frac{4}{5}y-\frac{1}{2}x+3y$

$\frac{4}{6}x+\frac{4}{5}y-\frac{3}{6}x+\frac{15}{5}y$

$\frac{1}{6}x+\frac{19}{5}y$

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

$6xw+8x^2+5w^2-10xw+5w^2-2x^2$

$10w^2-4xw+6x^2$

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

$12x^2+11x-5-x^2-1x+6$

$11x^2+10x-1$

2. Simplify the following expressions.

a. $\sqrt{25a^3b^2}$

$\sqrt{25a^2b^2}\sqrt{a}$

$5ab\sqrt{a}$

b. $\sqrt{48x^3y^7z^5}$

$\sqrt{16x^2y^6z^4}\sqrt{3xyz}$

$4xy^3z^2\sqrt{3xyz}$

c. $8\sqrt{7}-\sqrt{7}$

$7\sqrt{7}$

d. $\sqrt{18}-\sqrt{54}+2\sqrt{50}$

$\sqrt{9\cdot2}-\sqrt{9\cdot6}+2\sqrt{25\cdot2}$

$3\sqrt{2}-3\sqrt{6}+10\sqrt{2}$

$13\sqrt{2}-3\sqrt{6}$

e. $(\sqrt{3}-\sqrt{2})(\sqrt{3}+2\sqrt{2})$

$\sqrt{9}-\sqrt{6}+2\sqrt{6}-2\sqrt{4}$

$3-\sqrt{6}+2\sqrt{6}-4$

$-1+\sqrt{6}$

g. $(2\sqrt{3}+4)(4\sqrt{3}+2)$

$8\sqrt{9}+4\sqrt{3}+16\sqrt{3}+8$

$24+20\sqrt{3}+8$

$32+20\sqrt{3}$

3. Simplify each, rationalizing the denominator for your final answer:

a. $\frac{12}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$

$\frac{12\sqrt{3}}{3}$

$4\sqrt{3}$

b. $\frac{4}{3\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}$

$\frac{4\sqrt{2}}{6}$

$\frac{2\sqrt{2}}{3}$

c. $\frac{\sqrt{10}}{\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}$

$\frac{\sqrt{50}}{5}$

$\frac{5\sqrt{2}}{5}$

$\sqrt{2}$

4. Solve the following radical equations:

a. $6\sqrt{3k+5}=24$

$(\sqrt{3k+5})^2=(4)^2$

$3k+5=16$

$3k=11$

$k=11/3$

b. $4\sqrt{x-2}=x+1$

$16(x-2)=x^2+2x+1$

$16x-32=x^2+2x+1$

$0=x^2-14x+33$

$0=(x-11)(x-3)$

$x=11,3$

c. $\sqrt{b+1}=b-1$

$b+1=b^2-2b+1$

$b^2-b=0$

$b(b-1)=0$

$b=0,1$

no soln.

$\emptyset$

5. Demonstrate how to evaluate the following expression without a calculator.

a. $5!$

$5\cdot4\cdot3\cdot2\cdot1$

$20(6)$

$\boxed{120}$

b. $\dfrac{6!}{4!}$

$\dfrac{6\cdot5\cdot\cancel{4!}}{\cancel{4!}}$

$\boxed{30}$

c. $\dfrac{10!}{8!2!}$

$\dfrac{5\cancel{10}\cdot9\cdot\cancel{8!}}{\cancel{8!}\ \cancel{2}\cdot1}$

$\boxed{45}$

d. $\dfrac{5!}{2!(3!)}$

$\dfrac{5\cdot4\cdot\cancel{3!}}{2\cdot1\cdot\cancel{3!}}$

$\boxed{10}$

6. Simplify each of the monomial expressions below.

Consider the following: $x^a\cdot x^b=x^{a+b}$, $(x^a)^b=x^{ab}$, $\dfrac{x^a}{x^b}=x^{a-b}$, $x^{-1}=\dfrac{1}{x}$.

a. $\left(-x^4y^7\right)^5$

$-x^{20}y^{35}$

b. $(2x)^3\left(5x^2\right)$

$(8x^3)(5x^2)$

$40x^5$

c. $\left(3x^4y^2\right)\left(2x^7y\right)\left(5xy^4\right)$

$30x^{12}y^7$

d. $\dfrac{a^{-7}c^{-5}}{-a^{-5}c^{-9}}$

$-\dfrac{a^5c^9}{a^7c^5}$

$\boxed{-\dfrac{c^4}{a^2}}$

e. $\dfrac{57k^7d^3}{19k^{-3}d^5}$

$\boxed{\dfrac{3k^{10}}{d^2}}$

f. $\dfrac{2x^{-5}y^{-3}}{6x^4y^{-8}}$

$\dfrac{y^5}{3x^9}$

7. Simplify each of the following:

i

-1

$-i$

1

a. i^2

$\boxed{-1}$

b. $5-7i+3(2-i)$

$5-7i+6-3i$

$\boxed{11-10i}$

c. $(-3i)^2\cdot i^3$

$9i^2\cdot i^3$

$9i^5$

$\boxed{9i}$

d. $(5+6i)-(1-3i)$

$5+6i-1+3i$

$\boxed{4+9i}$

e. $(1+2i)(3-i)$

$3+6i-i-2i^2$

$3+5i+2$

$\boxed{5+5i}$

f. $-2(2-3i)(9+4i)$

$-2\left(18-27i+8i-12i^2\right)$

$-2(30-19i)$

$\boxed{-60+38i}$

Section 2. Algebraic Concepts

1. Completely factor the following expressions.

a. $3x^2 - 5x - 22$

$(3x-11)(x+2)$

b. $\frac{1}{9}m^2 - 4$

$\left(\frac{1}{3}m+2\right)\left(\frac{1}{3}m-2\right)$

c. $2x^2 - 4x - 126$

$2(x^2-2x-63)$

$2(x-9)(x+7)$

d. $c^2 - \frac{9}{25}$

$\left(c+\frac{3}{5}\right)\left(c-\frac{3}{5}\right)$

e. $mx^2 - 7mx + 12m$

$m(x^2-7x+12)$

$m(x-4)(x-3)$

f. $7 + 28a - 35b$

$7(1+4a-5b)$

2. Solve by factoring:

a. $x^2 + 7x + 10 = 0$

$(x+2)(x+5)=0$

$x=-2,-5$

b. $2x^2 + 7x = 9$

$2x^2+7x-9=0$

$(2x+9)(x-1)=0$

$x=-9/2, 1$

3. Solve by using the quadratic formula:

a. $x^2 = 8 - 10x$

$x^2+10x-8=0$

$a=1$, $b=10$, $c=-8$

$x=\frac{-10\pm\sqrt{100-4(-8)}}{2}$

$x=\frac{-10\pm\sqrt{132}}{2}$

$x=(-10\pm 2\sqrt{33})/2$

$x=-5\pm\sqrt{33}$

b. $x^2 = 7x$

$x^2-7x=0$

$a=1$, $b=-7$, $c=0$

$x=\frac{7\pm\sqrt{49-4(1)(0)}}{2}$

$x=\frac{7\pm\sqrt{49}}{2}$

$x=\frac{7\pm 7}{2}$

$x=7, 0$

4. Solve by using the square root method:

a. $16x^2 - 64 = 0$

$(4x+8)(4x-8)=0$

$x=-8/4, 8/4$

$x=-2, 2$

b. $2(x+5)^2 + 3 = 0$

$(x+5)^2=-3/2$

$x=-5\pm i\sqrt{\frac{3}{2}}$

$x=-5\pm i\frac{\sqrt{3}}{2}$

$\frac{\sqrt{3}}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}}=\frac{\sqrt{6}}{2}$

5. Solve by completing the square:

a. $x^2 = 72 - 2x$

$x^2 + 2x + 1 = 72 + 1$

$(x+1)^2 = 73$

$x = -1 \pm \sqrt{73}$

b. $5x^2 - 45x + 90 = 0$

$5(x^2 - 9x + (\frac{9}{2})^2) = -90 + 101.25$

$5(x - \frac{9}{2})^2 = 11.25$

$(x - \frac{9}{2})^2 = \frac{9}{4}$

$x = \frac{9}{2} \pm \frac{3}{2}$

$x = 6, 3$

6. Write an equation in factored form with the given solutions:

a. $x = 2, x = -7$

$(x-2)(x+7) = 0$

b. $x = 6, x = \frac{3}{5}$

$(x-6)(5x-3) = 0$

c. $x = -\frac{1}{2}, x = \frac{2}{7}$

$(2x+1)(7x-2) = 0$

7. Write an equation in standard form with the given solutions:

a. $x = 1, x = -9$

$(x-1)(x+9) = 0$

$x^2 + 8x - 9 = 0$

b. $x = -7, x = -\frac{1}{3}$

$(x+7)(3x+1) = 0$

$3x^2 + 22x + 7 = 0$

c. $x = 2 \pm 3i\sqrt{5}$

$x - 2 = 3i\sqrt{5}$

$(x-2)^2 = (3i\sqrt{5})^2$

$x^2 - 4x + 4 = -9(5)$

$x^2 - 4x + 49 = 0$

8. Determine the zeros of the quadratic function $f(x) = 15x^2 + x - 28$.

$(5x+7)(3x-4) = 0$

$x = -7/5, 4/3$

9. Find the quotient for each expression.

a. $\dfrac{x^2 + 12x + 36}{x + 6}$

$\dfrac{(x+6)(x+6)}{(x+6)}$

$x + 6$

b. $g(x) = \dfrac{x^2 - 2x + 2}{x - 3}$

$x + 1 + \frac{5}{x-3}$

$x-3 \overline{)\, x^2 - 2x + 2}$

$x + 1$

$-x^2 + 3x$

$x + 2$

$-x + 3$

$+5$

10. What is the conjugate of $(4 - 3i)$?

$4 + 3i$

11. Find the inverse of the function $f(x) = 5x + 9$.

$x = 5y + 9$

$\frac{x-9}{5} = y$.

$f^{-1}(x) = \frac{x-9}{5}$

12. On your calculator, graph the function $f(x) = -2x^2 + 3x - 6$. What is the highest point on the graph?

or use $\frac{-b}{2a}$

$x = \frac{-3}{-4} = \frac{3}{4}$

$f(\frac{3}{4}) = 2(\frac{9}{16}) + 3(\frac{3}{4}) - 6$

$= \frac{18}{16} + \frac{9}{4} - 6$

$= 202/16$

$= 10\frac{1}{8}$

$(\frac{3}{4}, \frac{108}{8})$

13. The cheerleaders at Bulls games launch T-Shirts into the crowd every time the Bulls win. The height of the T-shirt can be modeled by the function $h(x) = -16x^2 + 48x + 6$, where $h(x)$ represents the height in feet of the T-shirt after x seconds.

a. At what height was the T-shirt launched?

y-int = 6 feet

b. What is the maximum height that the T-shirt reaches?

c. When was the maximum height reached?

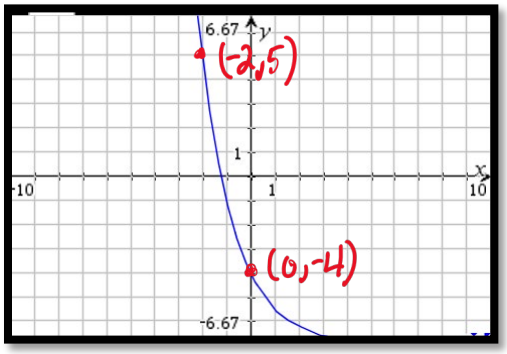
$x = \frac{-b}{2a} = \frac{48}{32} = \frac{3}{2}$ or 1.5 feet

$f(1.5) = -16(1.5)^2 + 48(1.5) + 6$

$= 37.5$ seconds

Section 3. Functions and their Properties

1. Find the rate of change of the graph below over the interval $[-2,0]$.



$\frac{5-(-4)}{-2-0}$

$\boxed{-\frac{9}{2}}$

2. Find the rate of change between the points $(-3,8)$ and $(5,4)$.

$\frac{8-4}{-3-5} = \frac{4}{-8} = \boxed{-\frac{1}{2}}$

3. Given the following functions, write the equation for the function translated 3 units up and 4 units to the right.

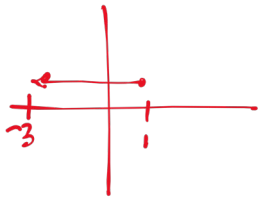
a. $g(x)=3(x-1)^2+7$ $g'(x)=3(x-5)^2+10$

b. $g(x)=\sqrt{x-5}$ $g'(x)=\sqrt{x-9}+3$

c. $g(x)=-4|x+11|-8$ $g'(x)=-4|x+7|-5$

4. $f(x)=2(x-1)^2+4$ and $g(x)=2(x+3)^2+1$. Describe the transformation of $f(x)$ to $g(x)$?

↓ down 3 units
← left 4 units.



5. Given the following functions, write the equation for the functions reflected over the y-axis.

a. $p(x)=-(x+3)^3-11$ $p'(x)=-(x-3)^3-11$

b. $p(x)=-3|x|+5$ $p'(x)=-3|x|+5$

c. $p(x)=2\sqrt{x+5}-3$ $p'(x)=2\sqrt{x-5}-3$

6. Note: When rotating a point (x, y) 90 degrees counterclockwise about the origin, the new point becomes $(-y, x)$.

a. The point $(3,2)$ lies on the function $f(x) = x + 1$ Find the coordinates of the point after the function is rotated 90 degrees counterclockwise about the origin.

$(-2, 3)$

b. If the function $f(x) = x^2 - 4$ is rotated 90 degrees counterclockwise, what is the new function?

$x = (-y)^2 - 4$

$x = y^2 - 4$

$x + 4 = y^2$

$\pm\sqrt{x+4} = y$

$y = \sqrt{x+4}$

use only the positive value to maintain "function"ality.

7. $f(x) = x - 6$ and $g(x) = 3x + 2$. If $g(x)$ can be written as $a \cdot f(x) + k$, what are the values of a and k?

$g(x) = a(x+6) + k$

$3x + 2 = ax + 6a + k$

$3x = ax$

$3 = a$

$2 = 6a + k$

$2 = 18 + k$

$-16 = k$

8. If $f(x) = 3x^2 - 4x + 1$ and $g(x) = -5x^2 + 2x - 10$, find $f(2) - g(3)$

$3(2)^2 - 4(2) + 1 - (-5(3)^2 + 2(3) - 10)$

$12 - 8 + 1 + 45 - 6 + 10$

54

9. What is the domain and range of the function $f(x) = \dfrac{3}{x-5}$?

$x - 5 \neq 0$

$x \neq 5$

$y \neq 0$

Domain: $(-\infty, 5) \cup (5, \infty)$

Range: $(-\infty, 0) \cup (0, \infty)$

Section 4. Geometry and Measurements

1. The formula to find the rate of change or slope is $m = \frac{y_2 - y_1}{x_2 - x_1}$. Solve the equation for y_2.

$m(x_2 - x_1) = y_2 - y_1$

$y_1 + m(x_2 - x_1) = y_2$

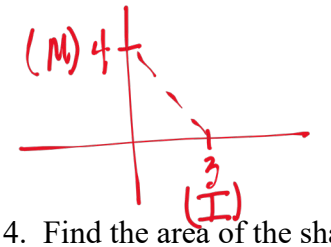
2. The distance formula for finding the distance between two points is $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$. Solve the equation for x_1.

$d^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

$\sqrt{d^2 - (y_2 - y_1)^2} = x_2 - x_1$

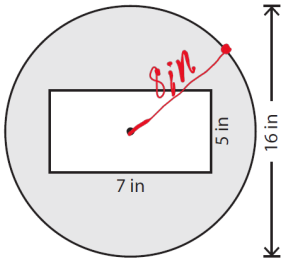
$x_1 = x_2 - \sqrt{d^2 - (y_2 - y_1)^2}$

3. On a coordinate grid where each unit represents 1 mile, Isabel's house is located at (3, 0) and a mall is located at (0, 4). What is the distance between Isabel's house and the mall?



5 miles

4. Find the area of the shaded region:

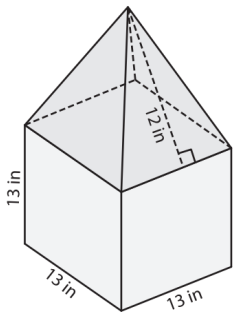


$A_\odot - A_\square$

$\pi(64) - 7(5)$

$(64\pi - 35)\ in^2$

5. Determine the surface area of the following figure.



(including the base)

$SA = 4(13^2) + 4\left(\frac{1}{2}\right)(13)(12) + 13^2$

$= 676 + 312 + 169$

$= 1157\ in^2$

6. Molly is designing a poster. The length of the poster is 6 inches longer than the width. If the poster requires 616in^2 of poster board, find the width w of the poster.



$lw = (l+w)w$

$w^2 + lw - lw = 0$

$(w+28)(w-22) = 0$

$w = -28, 22$

$w = 22$ in

factoring...

308 −2

154 · 4

11 · 14 · 4

11 · 7 · 2 · 4

22 · 28

7. The second angle in a triangle is 3° less than twice the first angle. The third angle measures 8° more than twice the first angle. Find each angle.



$a + b + c = 180$

$b = 2a - 3$

$c = 8 + 2a$

$a + 2a - 3 + 8 + 2a = 180$

$5a + 5 = 180$

$5a = 175$

$a = 35°$

$b = 2(35) - 3 = 67°$

$c = 8 + 2(35) = 78°$

8. The three angles of a triangle have measures of $(3x)^0$, $(x+10)^0$, and $(2x-40)^0$. Find the measure of the smallest angle in the triangle.

$3x + x + 10 + 2x - 40 = 180$

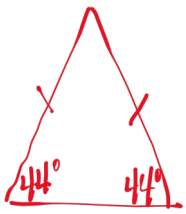
$6x - 30 = 180$

$6x = 210$

$x = 35$

$30°$

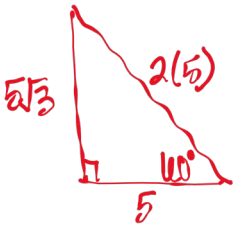
9. Suppose one base angle of an isosceles triangle has a measurement of 44°. What is the measure of the vertex angle?



$180 - 44 - 44$

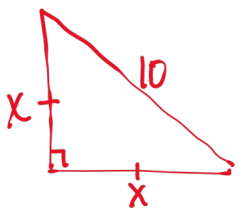
$92°$

10. In a 30-60-90 triangle, the shortest side is 5 cm. What is the length of the longest side?



$5\sqrt{3}$ cm

11. In a 45-45-90 triangle, if the length of the hypotenuse is 10 cm, what is the length of each leg?

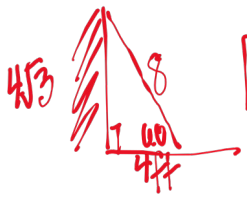


$x\sqrt{2} = 10$

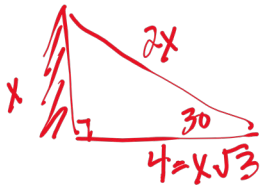
$x = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = 5\sqrt{2}$ cm

12. A ladder leans against a wall forming a 30-60-90 triangle with the ground. If the base of the ladder is 4 ft from the wall, how high does the ladder reach on the wall?



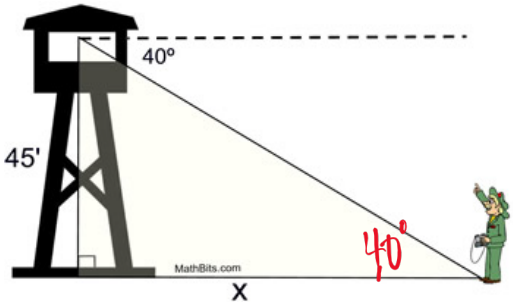
$4\sqrt{3}$ feet OR



$4 = x\sqrt{3}$

$\frac{4\sqrt{3}}{3}$ ft $= x$

13. Roger is looking up a guard tower that is 45 feet tall in the forest. The angle of depression from the top of the guard tower is 40°. To the nearest foot, determine how far is Roger from the guard tower?



$\tan 40^\circ = \frac{45'}{x}$

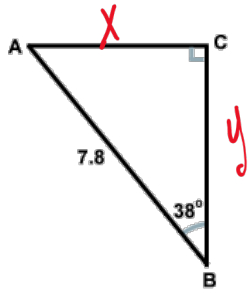
$x \cdot \tan 40 = 45'$

$x = \frac{45'}{\tan 40}$

$x \approx 53.62$

54 feet

14. Find the length of both AC and BC.



$\sin 38^\circ = \frac{x}{7.8}$

$7.8(\sin 38) = x$

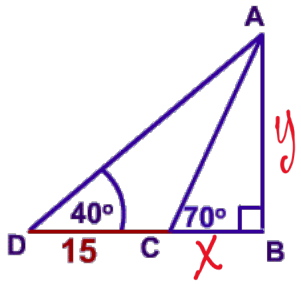
$4.802 \approx x = AC$

$\cos 38 = \frac{y}{7.8}$

$7.8(\cos 38) = y$

$6.146 \approx y = BC$

15. Using the diagram below, find the distance between CB.



$\tan 70 = \frac{y}{x}$ and $\tan 40 = \frac{y}{x+15}$

$(x \cdot \tan 70) = y$

$\tan 40 = \frac{x \cdot \tan 70}{x+15}$

$x\tan 40 + 15\tan 40 = x\tan 70$

$15\tan 40 = x$

$\tan 70 - \tan 40$

$6.595 \approx x$

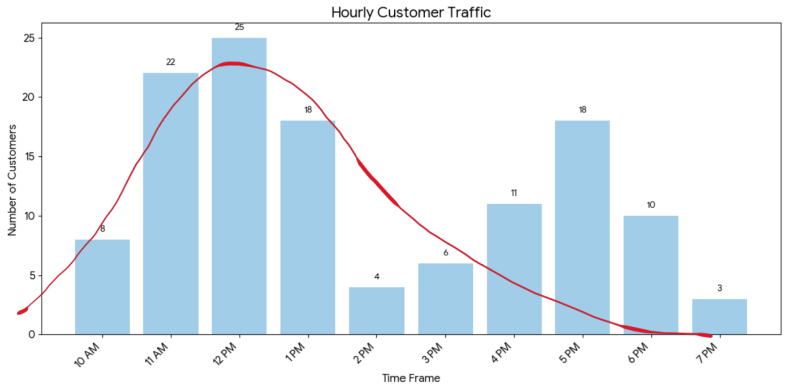
Section 5 – Statistics and Probability

Use the following information for problems 1. and 2.
A deli records the number of customers each hour that they are open to determine how many staff members they need working at each time of day. The number of customers is in the table below.

Time Frame	Number of Customers
10:00 A.M. – 11:00 A.M.	8
11:00 A.M. – 12:00 P.M.	22
12:00 P.M. – 1:00 P.M.	25
1:00 P.M. – 2:00 P.M.	18
2:00 P.M. – 3:00 P.M.	4
3:00 P.M. – 4:00 P.M.	6
4:00 P.M. – 5:00 P.M.	11
5:00 P.M. – 6:00 P.M.	18
6:00 P.M. – 7:00 P.M.	10
7:00 P.M. – 8:00 P.M.	3

total. 125 people.

1. Create a histogram to help the deli staff understand how many customers are in the deli at each time of day.



2. Determine if the data is skewed right, skewed left, or symmetric.

primarily skew right

3. Multiple Choice: For which of the following sets of numbers is the mean greater that the median?

a. {4,5,6,7,8}
mean: 6
median: 6

b. {6,7,8,9,15}
8
9

c. {4,6,6,6,8}
6
6

d. {2,6,6,6,6}
6
5.2

4. Identify each situation or scenario is a Combination or a Permutation. ← order is important.

a. A committee of 3 students is to be formed from a group of 10 students. P

b. The arrangement of 5 books on a shelf. P

c. Selecting 2 team captains from a basketball team of 8 players. C

d. Creating a password using 4 different letters from the alphabet (A-Z). C

5. Use what you know about Permutations and Combinations to determine the following.

a. How many different committees of 4 students can be formed from a class of 15 students?

$_{15}C_4 = 1365$ ways

b. In how many different ways can 3 students be chosen and arranged in a line from a group of 10 students?

$_{10}P_3 = 120$ ways

c. If a contest has 5 prizes and there are 12 participants, in how many ways can the prizes be awarded to the participants?

* prizes all the same. $_{12}C_5 = 792$ ways

d. How many ways can you select and arrange 4 books from a shelf containing 7 different books?

$_7P_4 = 840$ ways.

Section 6. Problem Solving Practice and Application

1. The function $g(x) = 160 + 1.5x$ models the weight gain of a basketball player as he starts a workout program where g is the weight in pounds after x weeks.

a. Explain the meaning of 160 in the context of this problem.

- the starting weight of the player

b. Explain the meaning of 1.5 in the context of this problem.

- the rate of weight gain each week (1.5 lbs/week)

c. Evaluate $g(6)$ and explain its meaning.

- amount of weigh at the end of 6 weeks

$g(6) = 160 + 1.5(6)$

$= 169$ lbs

2. Given a line through (–2, 4) and (8, –1), find the equation of the line perpendicular to the line through the midpoint of those points. Write the answer in slope intercept form.

$m = \frac{-1-4}{8+2} = \frac{-5}{10} = -\frac{1}{2}$ midpt $\left(\frac{6}{2}, \frac{3}{2}\right)$ $y - \frac{3}{2} = 2(x-3)$

$m_\perp = \frac{2}{1}$ $y = 2x - 6 + \frac{3}{2}$

$\boxed{y = 2x - \frac{9}{2}}$

3. Joe can drive 4 miles in m minutes. At this rate, how many minutes will it take him to drive 19 miles. Leave your answer in terms of m.

$19 \text{ miles} \times \frac{m \text{ min}}{4 \text{ miles}} = \frac{19}{4} m \text{ min}$ or $\boxed{4.75m \text{ minutes}}$

4. Lucille has a total of 23 dimes and pennies. The value of her coins is $1.85. How many dimes does she have? How many pennies does she have?

$d + p = 23$
$.1d + .01p = 1.85$ } solve system

$\boxed{\begin{array}{l} d = 18 \text{ dimes} \\ p = 5 \text{ pennies} \end{array}}$

5. Solve the following system of equations $\begin{array}{l} y - x = 1 \\ y = x^2 - 5 \end{array}$.

$x = (y-1)$

$y = (y-1)^2 - 5$

$y = y^2 - 2y + 1 - 5$

$0 = y^2 - 3y - 4$

$0 = (y-4)(y+1)$

$y = 4, -1$

$x = y - 1$

$x_4 = 4 - 1 = 3$

$x_{-1} = -1 - 1 = -2$

$\boxed{\begin{array}{l} (3, 4) \\ (-2, -1) \end{array}}$

6. Suppose you buy 3 shirts and 2 pairs of slacks on sale at a clothing store for $72. The next day, a friends buys 2 shirts and 4 pairs of slacks for $96. If the shirts you each bought were all the same price and the slacks were also all the same price, then what was the total cost of two shirts and two pairs of slacks?

$-2(3s + 2p = 72)$
$2s + 4p = 96$

$-6s - 4p = -144$
$2s + 4p = 96$
$-4s = -48$
$s = 12$

$2(12) + 4p = 96$
$4p = 72$
$p = 18$

$2s + 2p$
$24 + 36$
60

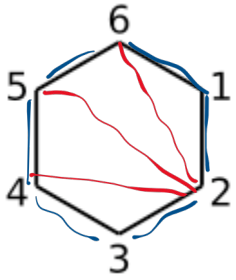
7. During an experiment, a ball is dropped from a height of 205 feet. The formula $h = -16t^2 + h_0$ can be used to approximate the number of seconds t it takes for the ball to reach height h from an initial height of h_0 in feet. Find the time it takes the ball to reach the ground.

$h(t) = -16t^2 + 205$
$0 = -16t^2 + 205$
$16t^2 = 205$
$t^2 = 205/16$

$t = \pm\sqrt{\frac{205}{16}}$
$t = \pm 3.579$

3.579 sec

8. Jim cuts a board in the shape of a regular hexagon and pound a nail at each vertex. How many rubber bands will he need to stretch a rubber band across every possible pair of nails?



ie. how many diagonals?

$d = \frac{n(n-3)}{2}$

$d = \frac{6(3)}{2}$

9 rubber bands