CCGPS Analytic Geometry | Factoring Quiz Review | Jan 20, 2015 (Tues)

Factor each polynomial and solve

1. $x^2 - 16x + 15 = 0$

$(x-15)(x-1)=0$

$x=1,\ x=15$

2. $14x^3 = 2x$

$14x^3-2x=0$

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

$7x^2-1=0$

$7x^2=1$

$x^2=\frac{1}{7}$

$x=\pm\sqrt{\frac{1}{7}}$

3. $2x^2 - x - 28 = 0$ 7, 4

$(2x+7)(x-4)=0$

$x=-7/2,\ x=4$

$a=2$

$b=-1$

$c=-28$

$7 \cdot -8 = -56$

$7 + -8 = -1$

1, 52

2, 2

$(x+7/2)(x-8/2)$

$(x+7/2)(x-4)$

$(2x+7)(x-4)$

4. $6x^3 + 15x^2 - 9x = 0$

$3x(2x^2+5x-3)=0$

$3x(2x-1)(x+3)=0$

$x=0,\ 1/2,\ -3$

5. $2x^2 + 16x = 40$

$2x^2+16x-40=0$

$2(x^2+8x-20)=0$

$2(x+10)(x-2)=0$

$x=-10,\ 2$

6. $9x^2 = 4$

$9x^2-4=0$

$(3x-2)(3x+2)=0$

$x=2/3,\ -2/3$

7. $2x^2 - 98 = 0$

$2(x^2 - 49) = 0$

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

$x = 7, -7$

8. $3x^2y - 6xy - 45y$

$3y(x^2 - 2x - 15)$

$\boxed{3y(x-5)(x+3)}$

9. $2x^2 = -8x + 42$

$2x^2 + 8x - 42 = 0$

$2(x^2 + 4x - 21) = 0$

$\boxed{2(x+7)(x-3) = 0}$

$\boxed{x = -7, 3}$

10. $6bx^2 + 7bx + 2b$

$b(6x^2 + 7x + 2)$

$\boxed{b(3x+2)(2x+1)}$

11. $4x^2 + 6x - 4 = 0$

$2(2x^2 + 3x - 2) = 0$

$\boxed{2(2x-1)(x+2) = 0}$

$\boxed{x = 1/2, -2}$

12. $12x^2 - 2x = 30$

$12x^2 - 2x - 30 = 0$

$2(6x^2 - x - 15) = 0$

$\boxed{2(3x-5)(2x+3) = 0}$

$\boxed{x = 5/3, -3/2}$

CCGPS Analytic Geometry **Unit 5A Test Review #2**

Solution Key

Solve equation by factoring

1. $48x^3 = 9x + 6x^2$ $\quad 48x^3 - 6x^2 - 9x = 0$

$3x(16x^2 - 2x - 3) = 0$

-48: -8, 6; 16, -2

$3x(x - \frac{8}{16})(x + \frac{6}{16}) = 0$

$3x(x - \frac{1}{2})(x + \frac{3}{8}) = 0$

$3x(2x-1)(8x+3)$

Factored Form: $3x(8x+3)(2x-1)$

Solution: $x = 0, -3/8, +1/2$

Solve equation by Completing the Square

2. $16 + 4x^2 = 32x$

$\frac{4x^2}{4} - \frac{32x}{4} + \frac{16}{4} = 0$

$x^2 - 8x + 4 = 0$

$x^2 - 8x + \underline{16} = -4 + \underline{16}$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$

$(x-4)(x-4) = 12$

$(x-4)^2 = 12$

$\sqrt{(x-4)^2} = \pm\sqrt{12}$

$x - 4 = \pm 2\sqrt{3}$

$\boxed{x = 4 \pm 2\sqrt{3}}$

3. a) Solve equation by quadratic formula
b) Find the discriminant
c) Based on the discriminant, find the number and the type of solutions

$3 - 4x^2 = 7x$ $\quad 4x^2 + 7x - 3 = 0$

$a = 4$
$b = 7$
$c = -3$

$\frac{-7 \pm \sqrt{(7)^2 - 4(4)(-3)}}{2(4)}$

$\frac{-7 \pm \sqrt{97}}{8} = \boxed{\frac{-7}{8} \pm \frac{\sqrt{97}}{8}}$

Discriminant $= 97 > 0$

2 Real solutions

4. Solve equation choosing a method (this may be solved multiple ways) *quadratic formula

$4x^2 + 12x^3 = 12x$ $\quad 12x^3 + 4x^2 - 12x = 0$

$4x(3x^2 + 1x - 3) = 0$

$a = 3$
$b = 1$
$c = -3$

$\frac{-1 \pm \sqrt{1^2 - 4(3)(-3)}}{2(3)}$

$\boxed{\frac{-1 \pm \sqrt{37}}{6} \quad x = \frac{-1}{6} \pm \frac{\sqrt{37}}{6}}$

Discriminant $= 37 > 0$

2 Real Roots

Solve equation by factoring

5. $20x^4 - 60x^2 - 65x^3 = 0$

$20x^4 - 65x^3 - 60x^2 = 0$

$5x^2(4x^2 - 13x - 12) = 0$

-48

$-16 \quad 3$

$4 \quad 4$

-13

1, 48
2, 24
3, 16
4, 12
6, 8

$5x^2(x - \frac{16}{4})(x + \frac{3}{4})$

$5x^2(x-4)(4x+3)$

Factored Form: $5x^2(x-4)(4x+3)$

Solution: $x = 0, 4, -3/4$

Solve equation by Completing the Square

6. $2x^2 + 10 = 16x$ $\quad \frac{2x^2}{2} - \frac{16x}{2} + \frac{10}{2} = \frac{0}{2}$

$x^2 - 8x + 5 = 0$

$x^2 - 8x + 16 = -5 + 16$

$\left(\frac{b}{2}\right)^2 = \left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$

$(x-4)^2 = 11$

$\sqrt{(x-4)^2} = \pm\sqrt{11}$

$x - 4 = \pm\sqrt{11}$

$\boxed{x = 4 \pm \sqrt{11}}$

7. a) Solve equation by quadratic formula
b) Find the discriminant
c) Based on the discriminant, find the number and the type of solutions

$2x^2 + 7x = 9$ $\quad 2x^2 + 7x + 9 = 0$

$\frac{-7 \pm \sqrt{49 - 4(2)(+9)}}{2(2)}$

$\frac{-7 \pm \sqrt{-23}}{4} = \frac{-7 \pm i\sqrt{23}}{4}$

$\boxed{x = \frac{-7}{4} \pm \frac{i\sqrt{23}}{4}}$

$D = -23 < 0$

2 imaginary Roots

8. Create a quadratic function that has solutions at $x = -3/4$, and $x = 2/3$. Make sure that it is written in standard form $ax^2 + bx + c = 0$

$(x + \frac{3}{4})(x - \frac{2}{3})$

$(4x+3)(3x-2)$

$12x^2 - 8x + 9x - 6$

$\boxed{12x^2 + 1x - 6}$

Analytic Geometry Unit 5B Practice

Key

1. $y = x^2 - 4x - 12$

$x = \frac{-b}{2a} = \frac{+4}{2(1)} = 2$

x	y
0	-12
1	-15
2	-16
3	-15
4	-12

Form: standard a = 1 Opens: up

Vertex: (2, -16) AOS: x = 2

x-int: (-2, 0), (6, 0) y-int: (0, -12)

Domain: (-∞, ∞) Range: [-16, ∞)

End Behavior: As x → ∞, f(x) → +∞

As x → -∞, f(x) → +∞

Interval of Increase: (2, ∞)

Interval of Decrease: (-∞, 2)

Interval(s) of Positive: (-∞, -2) ∪ (6, ∞)

Interval(s) of Negative: (-2, 6)

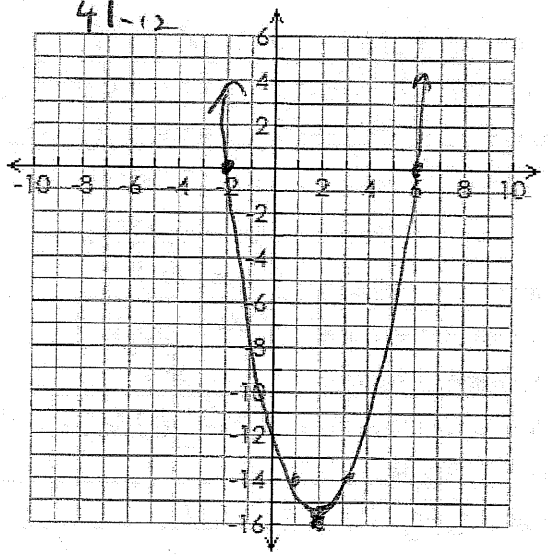
Min: (2, -16) or -16

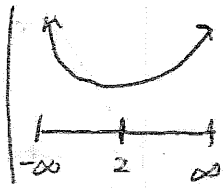
Max: none

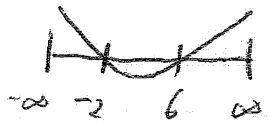
Average Rate of Change from [4, 6] = 6

(4, -12)
(6, 0)

$\frac{-12-0}{4-6} = \frac{-12}{-2} = 6$







2. $y = 2(x + 3)(x - 1)$

Form: intercept / factored a = 2 Opens: up

Vertex: (-1, -8) AOS: x = -1

x-int: (-3, 0) (1, 0) y-int: (0, -6)

Domain: (-∞, ∞) Range: [-8, ∞)

End Behavior: As x → ∞, f(x) → +∞

As x → -∞, f(x) → +∞

Interval of Increase: (-1, ∞)

Interval of Decrease: (-∞, -1)

Interval(s) of Positive: (-∞, -3) ∪ (1, ∞)

Interval(s) of Negative: (-3, 1)

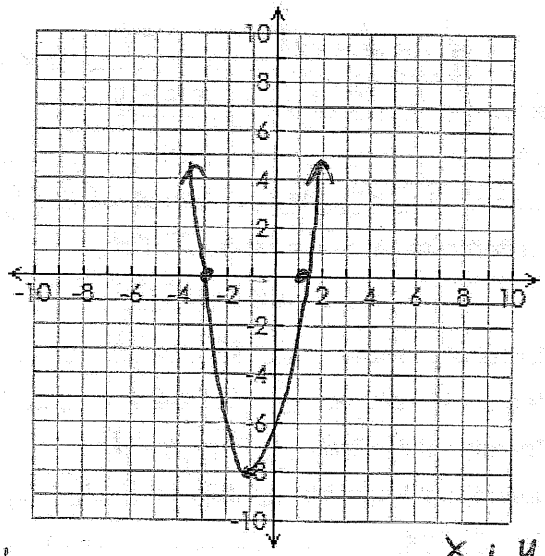
Min: (-1, -8) or -8

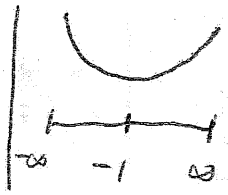
Max: none

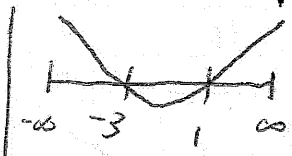
Average Rate of Change from [-4, 0] = -1

(-4, 10)
(0, -6)

$\frac{10-6}{-4-0} = \frac{4}{-4}$







x	y
-3	0
-2	-6
-1	-8
0	-6
1	0

x	y
2	12
3	15
4	16
5	15
6	12

3. $y = -(x-4)^2 + 16$

Form: vertex a = -1 Opens: down

Vertex: (4, 16) AOS: x = 4

x-int: (0, 0) (8, 0) y-int: (0, 0)

Domain: (-∞, ∞) Range: (-∞, 16]

End Behavior: As x → ∞, f(x) → -∞

As x → -∞, f(x) → -∞

Interval of Increase: (-∞, 4)

Interval of Decrease: (4, ∞)

Interval(s) of Positive: (0, 8)

Interval(s) of Negative: (-∞, 0) U (8, ∞)

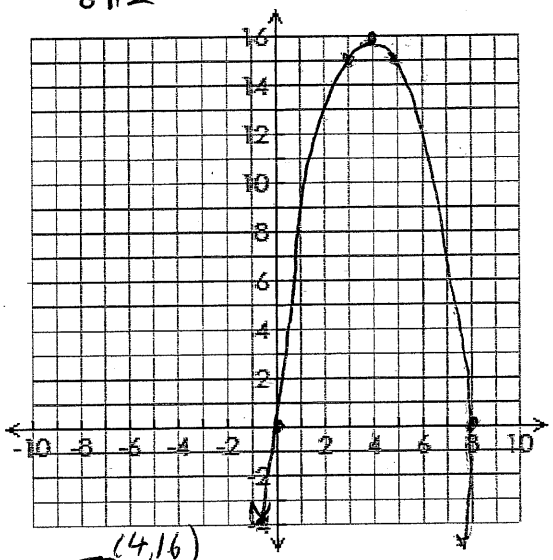
Min: none

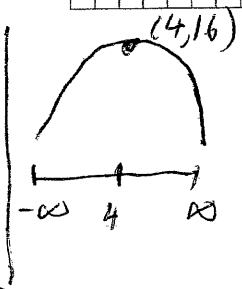
Max: (4, 16) or 16

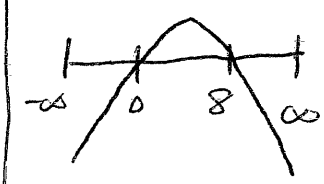
Average Rate of Change from [0, 2] = 6

(0, 0)
(2, 12)

$\frac{12-0}{2-0} = 6$







$x = \frac{-b}{2a} = \frac{10}{2(-1)} = -5$

4. $y = -x^2 - 10x - 21$

Form: standard a = -1 Opens: down

Vertex: (-5, 4) AOS: x = -5

x-int: y-int:

Domain: (-∞, ∞) Range: (-∞, -5]

End Behavior: As x → ∞, f(x) → -∞

As x → -∞, f(x) → -∞

Interval of Increase: (-∞, -5)

Interval of Decrease: (-5, ∞)

Interval(s) of Positive: (-7, -3)

Interval(s) of Negative: (-∞, -7) U (-3, ∞)

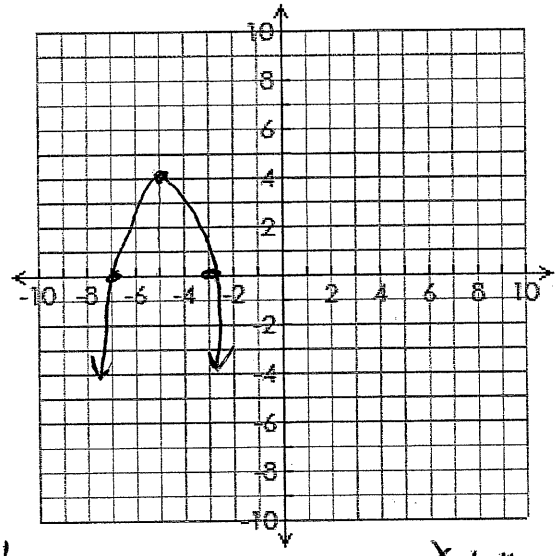
Min: none

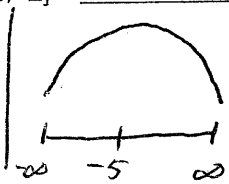
Max: (-5, 4) or 4

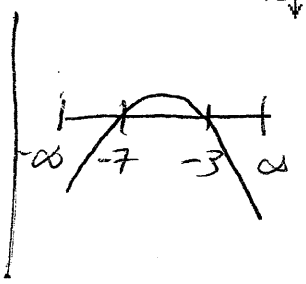
Average Rate of Change from [-6, -2] = -2

(-6, 3)
(-2, -5)

$\frac{3+5}{-6+2} = \frac{8}{-4} = -2$







x	y
-7	0
-6	3
-5	4
-4	3
-3	0

Analytic Geometry Unit 5B Practice

For the following problems, either state the transformation that are occurring or write the equation based on the transformations given.

5. $y = -2(x-4)^2 + 7$

Vertex: (4, 7) Horizontal translation: right 4 units

Vertical translation: up 7 units Stretch/compress/reflect: ① reflection ② stretch by factor of 2

6. $y = -\frac{1}{2}(x-3)^2 - 9$

Vertex: (3, −9) Horizontal translation: right 3 units

Vertical translation: down 9 units Stretch/compress/reflect: ① reflection ② compress by factor of 1/2

7. $y = -(x+5)^2 + 0$

Vertex: (−5, 0) Horizontal translation: left 5 units

Vertical translation: none Stretch/compress/reflect: ① reflection ② no stretch/compression

8. The function $y = x^2$, is translated 3 to the right and 4 down.

$y = (x-3)^2 - 4$

9. The function $y = x^2$ is reflected over the x – axis and translated 8 up.

$y = -(x-0)^2 + 8$ or

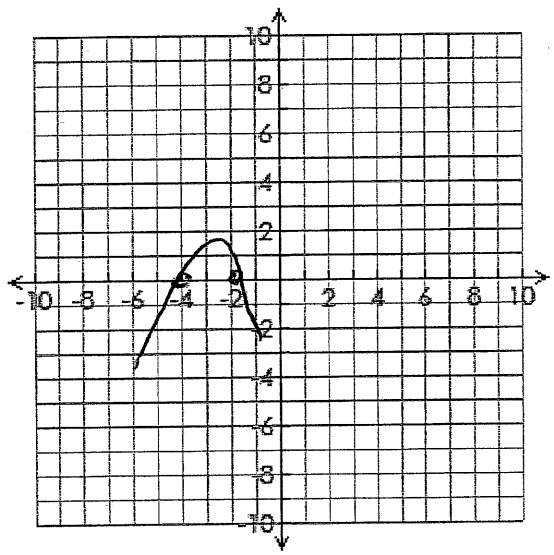
$y = -(x)^2 + 8$

10. The function $y = x^2$ is stretched by a factor of 3 and translated 3 to the left.

$y = 3(x+3)^2 + 0$

For the following problems, sketch a graph of the inequality and write the solutions in interval notation.

11. $y \geq -4x^2 - 24x - 32$ Solutions: $[-4, -2]$

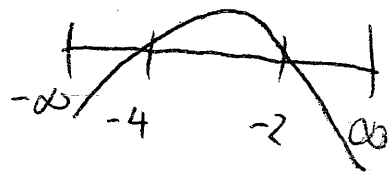


$-4x^2 - 24x - 32$

$-4(x^2 + 6x + 8)$

$-4(x+2)(x+4)$

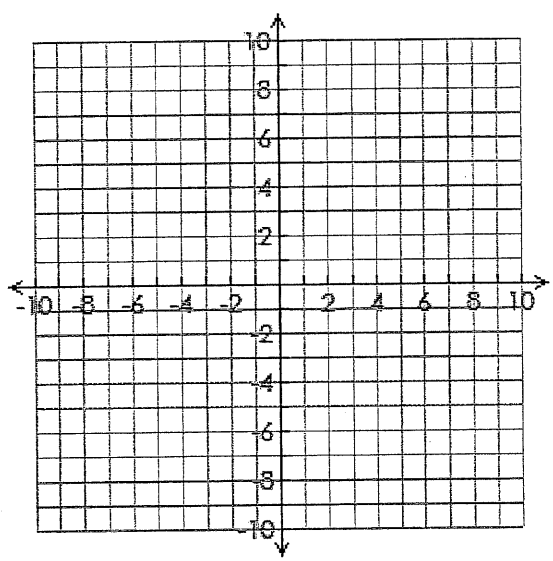
$x = -2, -4$



pos: $[-4, -2]$

neg: $(-\infty, -4] \cup [-2, \infty)$

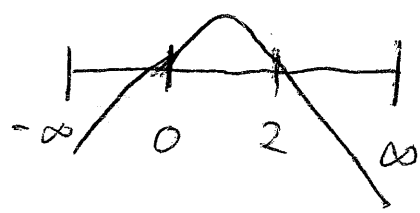
12. $y < -2x^2 + 4x$ Solutions: $(-\infty, 0) \cup (2, \infty)$



$-2x^2 + 4x$

$-2x(x-2)$

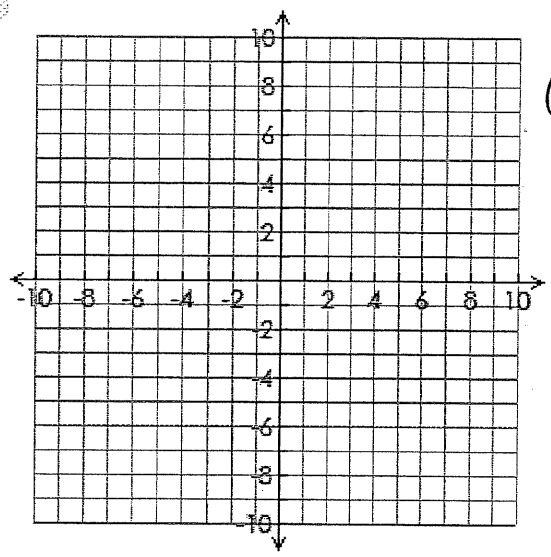
$x = 0, x = 2$



pos: $(0, 2)$

neg: $(-\infty, 0) \cup (2, \infty)$

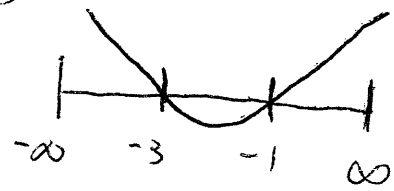
13. $y \geq x^2 + 4x + 3$ Solutions: $(-\infty, -3] \cup [-1, \infty)$



$x^2+4x+3=0$

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

$x=-1, -3$

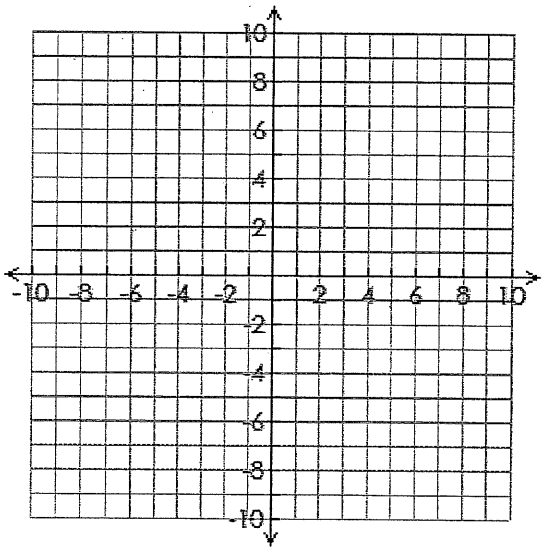


opens up

pos: $(-\infty, -3) \cup (-1, \infty)$

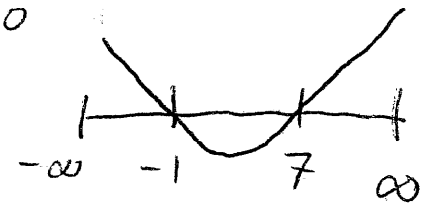
neg: $(-3, -1)$

14. $y < 2(x-7)(x+1)$ Solutions: $(-1, 7)$



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

$x=7, x=-1$



opens up

pos: $(-\infty, -1) \cup (7, \infty)$

neg: $(-1, 7)$

15. The product of two numbers is 640. Their difference is 12. Find the two numbers.

$x \cdot y = 640$ $x - y = 12$

first #: x

2nd #: $x-12$

$x(x-12)=640$

$x^2-12x=640$

$x^2-12x-640=0$

$\frac{12 \pm \sqrt{12^2-4(1)(-640)}}{2(1)} = \frac{12 \pm \sqrt{2704}}{2}$

$\frac{12 \pm 52}{2} = \frac{12+52}{2}$ and $\frac{12-52}{2}$

$x=32$ $x=-20$

$\boxed{32 \text{ and } 20}$ $\boxed{-20 \text{ and } -32}$

16. Jason jumped off of a cliff that is 480 feet high, into the ocean in Acapulco with initial velocity of 16 ft/s, while vacationing with some friends. His height as a function of time could be modeled by the function $h(t) = -16t^2 + v_i t + h_i$, where t is the time in seconds and h is the height in feet.

a. How long did it take for Jason to reach the water?

$h(t) = 0$ $\quad 0 = -16t^2 + 16t + 480$

$V_i = 16$ $\quad 0 = -16(t^2 - t - 30)$

$h_i = 480$ $\quad 0 = -16(t+5)(t-6)$

$t = -5$, $\boxed{t = 6}$

extraneous solution

$\boxed{t = 6 \text{ seconds}}$

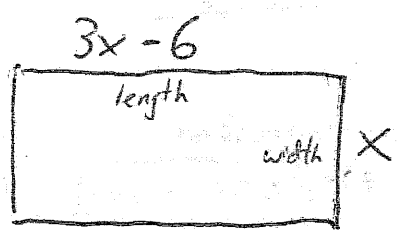
b. What was the highest point that Jason reached? (think about how to find the vertex of this parabola)

$$\frac{-b}{2a} = \frac{-16}{2(-16)} = \frac{1}{2}$$

$$h\left(\tfrac{1}{2}\right) = -16\left(\tfrac{1}{2}\right)^2 + 16\left(\tfrac{1}{2}\right) + 480$$

$$\boxed{h\left(\tfrac{1}{2}\right) = 484 \text{ ft.}}$$

17. The length of a rectangle is 6 less than 3 times the width. The area of the rectangle is 144 square inches. Find the length and the width.



length × width = Area

$(3x-6)(x) = 144$

$3x^2 - 6x = 144$

$3x^2 - 6x - 144 = 0$

$3(x^2 - 2x - 48) = 0$

$3(x-8)(x+6) = 0$

$x = 8$, $x = -6$

$\boxed{\text{width} = x = 8 \text{ in.}}$

$\boxed{\text{length} = 3x - 6 = 3(8) - 6 = 18 \text{ in.}}$

CCGPS Analytic Geometry
Circle Quiz Review WS #1

Name Key

Circle equation: $(x-h)^2 + (y-k)^2 = r^2$

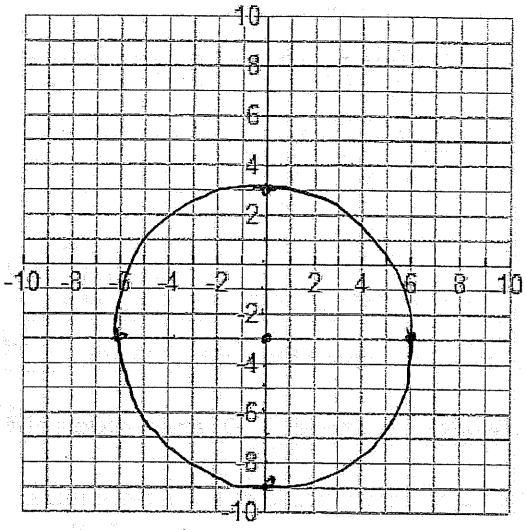
Midpoint: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

1. Given the circle: $x^2 + (y+3)^2 = 36$

a. Identify the center: $(0, -3)$

b. Identify the radius: $r = 6$

c. Graph the circle.



$(0,0)$ x y

h k

2. Given the circle whose center is the origin and goes through the point (-2, 7)

Write the equation of the circle in standard form: $(x-0)^2+(y-0)^2=53$

*Find r^2 first.

$r^2 = (0--2)^2 + (0-7)^2$

$r^2 = 2^2 + 7^2$

$r^2 = 4 + 49$

$r^2 = 53$

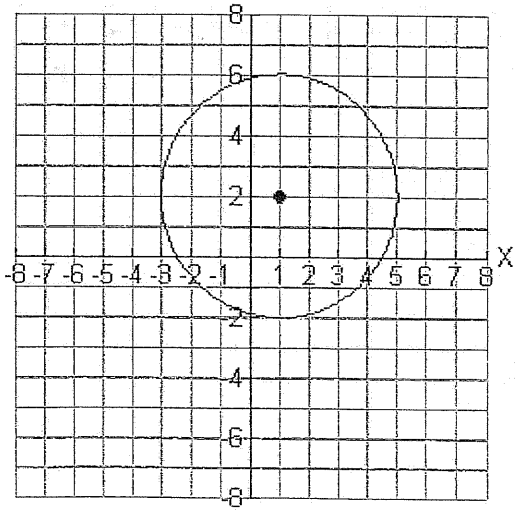
3. Given the following graph of the circle:

Identify the center: $(1, 2)$

Identify the radius: $r = 4$

Write the equation in standard form:

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



Circle equation: $(x-h)^2 + (y-k)^2 = r^2$ Midpoint: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

4. Given the equation below:

$y^2 + 2x + x^2 = 24y - 120$

$x^2 + 2x + \underline{1} + y^2 - 24y + \underline{144} = -120 + \underline{1} + \underline{144}$

$\left(\frac{2}{2}\right)^2 = (1)^2 = 1$ $\left(\frac{-24}{2}\right)^2 = (-12)^2 = 144$

$(x \quad)^2 + (y \quad)^2 = 25$

$\boxed{(x+1)^2 + (y-12)^2 = 25}$

A. Write this equation in standard form: $(x+1)^2 + (y-12)^2 = 25$

B. Identify the center and radius of the circle. Center: $(-1, 12)$ Radius: 5.

5. Given the circle with a center at (1, -7) and a radius of $\sqrt{15}$.

Write the equation of the circle in standard form: $(x-1)^2 + (y+7)^2 = 15$

$x \quad y \qquad h \quad k$

6. The circle passes through the point (5, 6) and has its center at (2, 3).

Write the equation of the circle in standard form: $(x-2)^2 + (y-3)^2 = 18$

* find r^2

$r^2 = (x-h)^2 + (y-k)^2$

$r^2 = (5-2)^2 + (6-3)^2$

$r^2 = 3^2 + 3^2 = 18$

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

7. The endpoints of a diameter are at (2, 3) and at (−6, −5). $x_1 \; y_1$ $x_2 \; y_2$

* use midpt. t. find center

* use circle equation to find radius

Write the equation of the circle in standard form: $(x+2)^2 + (y+1)^2 = 32$

Midpt. $\left(\frac{2-6}{2}, \frac{3-5}{2}\right)$ center $(-2, -1)$ $h \quad k$

$r^2 = (2+2)^2 + (3+1)^2$

$r^2 = 4^2 + 4^2$

$r^2 = 16 + 16$

$r^2 = 32$

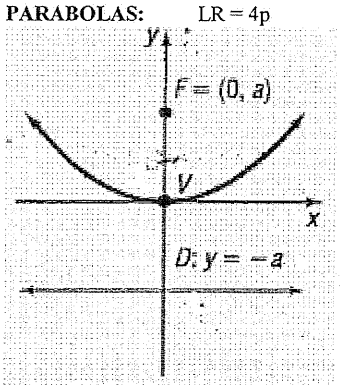
Conics: Parabola Day 1

March 9, 2015 (Mon)

Key

Parabola: a conic section where the distance from 1 fixed point (focus) and a line is equal.

PARABOLAS: LR = 4p



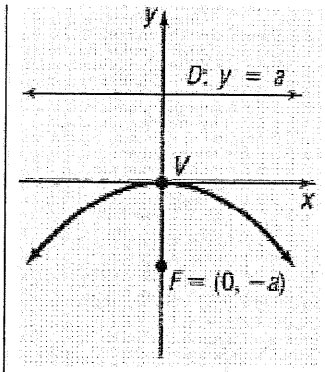
Graph opens up
(Think $y = x^2$)

$(x - h)^2 = 4p\,(y - k)$

Vertex (h, k)
p: distance from vertex to focus (inside parabola)
p: distance from vertex to directrix (line outside parabola)

Axis of Symmetry(AOS) : x = h

LR = |4p|



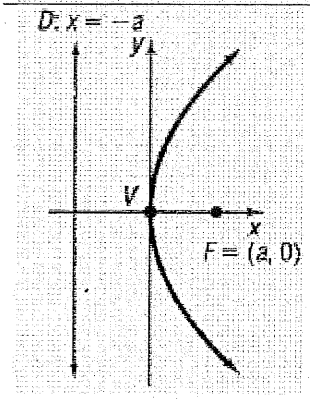
Graph opens down
(Think $y = -x^2$)

$(x - h)^2 = 4p\,(y - k)$

Vertex (h, k)
p: distance from vertex to focus (inside parabola)
p: distance from vertex to directrix (line outside parabola)

AOS: x = h

LR = |4p|



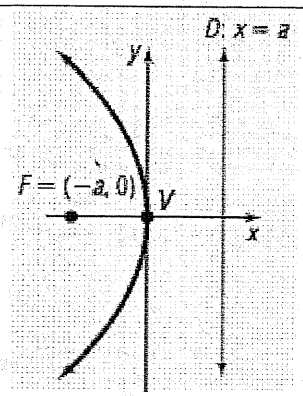
Graph opens right
(Think $x = y^2$)

$(y - k)^2 = 4p\,(x - h)$

Vertex (h, k)
p: distance from vertex to focus (inside parabola)
p: distance from vertex to directrix (line outside parabola)

AOS: y = k

LR = |4p|



Graph opens left
(Think $x = -y^2$)

$(y - k)^2 = 4p\,(x - h)$

Vertex (h, k)
p: distance from vertex to focus (inside parabola)
p: distance from vertex to directrix (line outside parabola)

AOS: y = k

LR = |4p|

Graph the parabola: State the vertex, AOS, focus, directrix, and LR

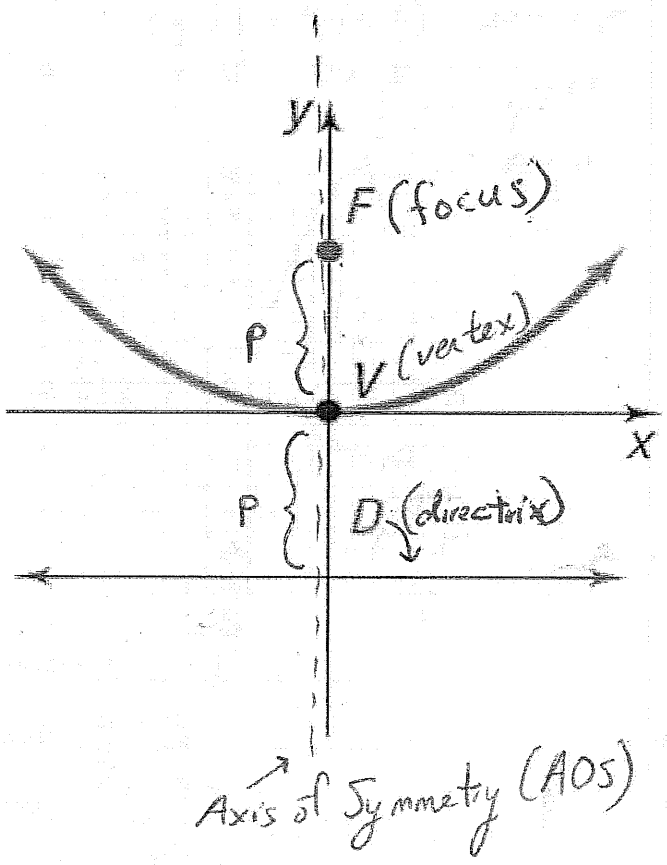
$(x-h)^2 = \boxed{4p}(y-k)$

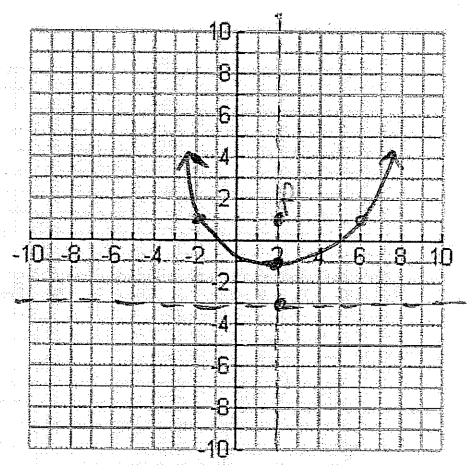
1. $(x - 2)^2 = 8(y + 1)$

opens up

$4p = 8$

$p = 2$





Vertex: (2, −1)

AOS: x = 2

Focus: (2, 1)

Directrix: y = −3

LR: 4p = 8 4(2) = $\boxed{8}$

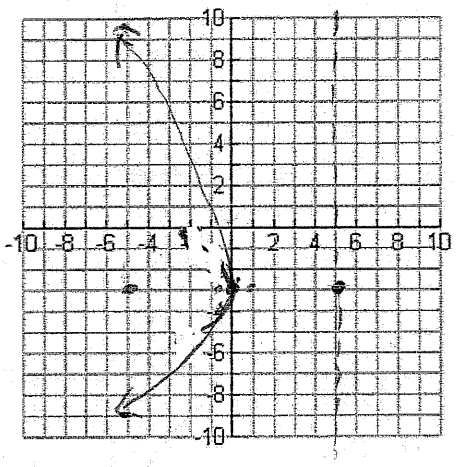
Graph the parabola: State the vertex, AOS, focus, directrix, and LR

2. $(y + 3)^2 = -20x$ $(y-k)^2 = 4p(x-h)$

opens left $(y+3)^2 = -20(x-0)$

$4p = -20$

$p = -5$



Vertex: $(0,-3)$

AOS: $y=-3$

Focus: $(-5,-3)$

Directrix: $x=5$

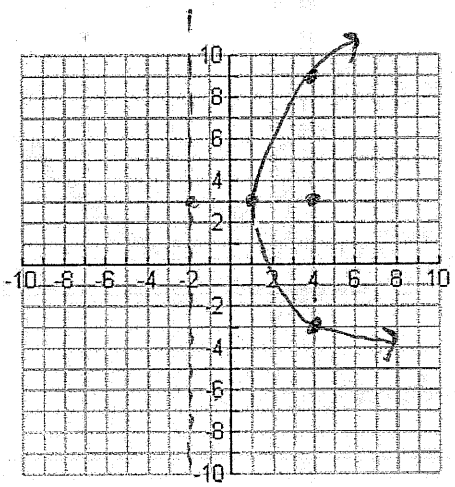
LR: $4(5) = 20$

$(y-k)^2 = 4p(x-h)$ opens right

4. $(y - 3)^2 = 12(x - 1)$

$4p = 12$

$p = 3$



Vertex: $(1,3)$

AOS: $y=3$

Focus: $(4,3)$

Directrix: $x=-2$

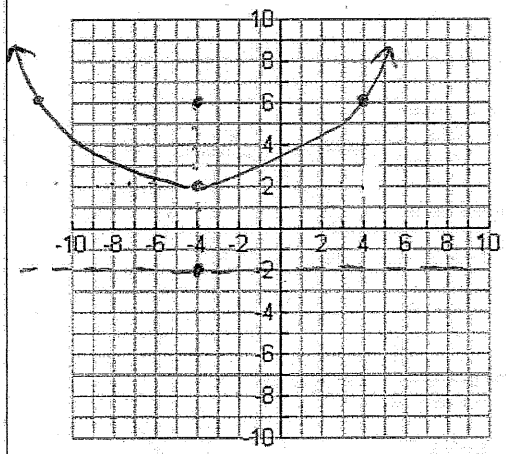
LR: $4(3)=12$

$(x-h)^2 = 4p(y-k)$

opens up 3. $(x + 4)^2 = 16(y - 2)$

$4p = 16$

$p = 4$



Vertex: $(-4,2)$

AOS: $x=-4$

Focus: $(-4,6)$

Directrix: $y=-2$

LR: $4(4)=16$

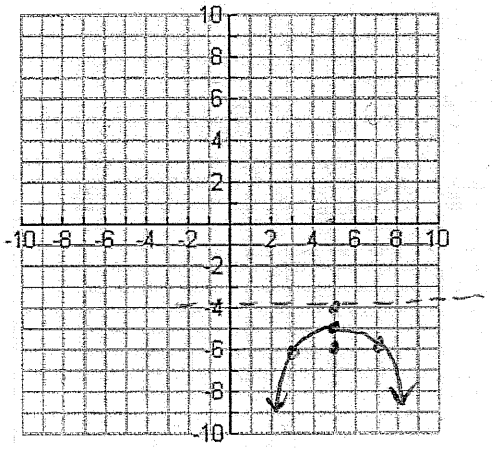
opens down

$(x-h)^2 = 4p(y-k)$

5. $(x - 5)^2 = -4(y + 5)$

$4p = -4$

$p = -1$



Vertex: $(5,-5)$

AOS: $x=5$

Focus: $(5,-6)$

Directrix: $y=-4$

LR: $4(1)=4$

CCGPS Analytic Geometry **Unit 6 Review 2**

Circles, Parabolas, Systems of Equations

Equations: $(x-h)^2+(y-k)^2=r^2$ $(x-h)^2=4p(y-k)$ $(y-k)^2=4p(x-h)$

Key

Graph the equation and identify the important characteristics

1. $8y+x^2-4x+1=5$

$x^2-4x+\underline{4}=-8y+4+\underline{4}$

$(x-2)^2=-8y+8$

$(x-2)^2=-8(y-1)$

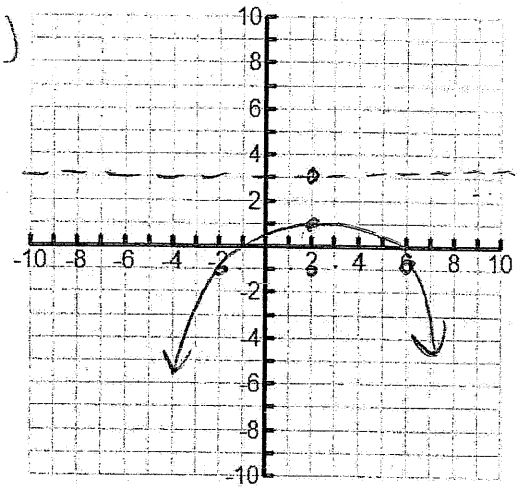
$\left(\frac{b}{2}\right)^2=\left(\frac{-4}{2}\right)^2=(-2)^2=4$

Standard Form: $(x-2)^2=-8(y-1)$

Opens: down Vertex: $(2,1)$ p = -2

Focus: $(2,-1)$ Directrix: $y=3$

Focal Width: 8 Axis of Symmetry: $x=2$



Write the equation for each circle in standard form. Then identify the center and radius.

2. The endpoints of a diameter are at (-4, 4) and at (-8, 2).

Midpt $\left(\frac{-4-8}{2}, \frac{4+2}{2}\right)=\left(\frac{-12}{2}, \frac{6}{2}\right)=(-6,3)$

center $(\overset{h}{-6}, \overset{k}{3})$ $(x-h)^2+(y-k)^2=r^2$

point $(\overset{x}{-4}, \overset{y}{4})$ $(-4+6)^2+(4-3)^2=r^2$

$(2)^2+(1)^2=r^2$

$\underline{5=r^2}$

Equation: $(x+6)^2+(y-3)^2=4$ Center: $(-6,3)$ Radius: $\sqrt{5}\approx 2.24$

3. $x^2+y^2+2x-4y-11=0$

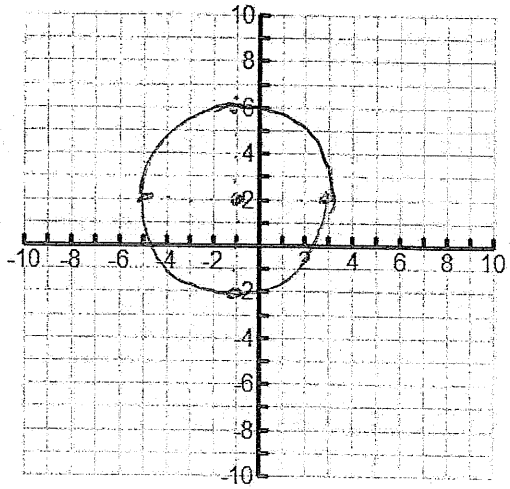
$x^2+2x+\underline{1}+y^2-4y+\underline{4}=11+\underline{1}+\underline{4}$

$\left(\frac{2}{2}\right)^2=(1)^2=1$

$\left(\frac{-4}{2}\right)^2=(-2)^2=4$

$(x\quad)^2+(y\quad)^2=16$

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



Standard Form Equation: $(x+1)^2+(y-2)^2=16$

Center: $(-1,2)$ Radius: 4

4. Given the circle with a center at (-2, 6) and a radius of $(5\sqrt{2})^2 = r^2 = 50$

h k

Write the equation of the circle in standard form: $(x+2)^2+(y-6)^2=50$

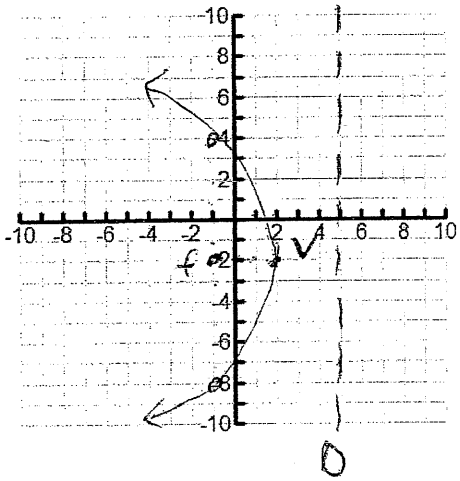
5. Find the standard form of the equation for the parabola with a focus located at (-1, –2) and directrix at $x=5$

Vertex $(\overset{h}{2}, \overset{k}{-2})$

$p=-3$

opens left

$(y-k)^2=4p(x-h)$



Standard form equation $(y+2)^2=-12(x-2)$

6. Solve the system $\begin{cases} x^2+y^2=36 \\ x+y+6=0 \end{cases}$ using algebra. SHOW ALL WORK.

$y=-6-x$

$x^2+(-6-x)^2=36$

$x^2+(-6-x)(-6-x)=36$

$x^2+36+6x+6x+x^2-36=0$

$2x^2+12x=0$

$2x(x+6)=0$

$2x=0$	$x+6=0$
$x=0$	$x=-6$
$(0,-)$	$(-6,-)$

$y=-6-x$

$\boxed{(0,-6) \text{ and } (-6,0)}$

7. Solve the system $\begin{cases} y^2+8x-6y+9=-8 \\ 2x+y=1 \end{cases}$ using algebra. SHOW ALL WORK.

$y=1-2x$

$(1-2x)^2+8x-6(1-2x)+9+8=0$

$(1-2x)(1-2x)+8x-6+12x+17=0$

$1-2x-2x+4x^2+20x+11=0$

$4x^2+16x+12=0$

$4(x^2+4x+3)=0$

$4(x+3)(x+1)=0$

$x+3=0$	$x+1=0$
$x=-3$	$x=-1$
$(-3,-)$	$(-1,-)$

$y=1-2x$

$\boxed{(-3,7) \text{ and } (-1,3)}$

Key

CCGPS Analytic Geometry Probability Test Review 2 Combinations

1. The math club is electing new officers. There are 4 candidates for president, 5 candidates for vice-president, 2 candidates for secretary, and 1 candidate for treasurer. How many different combinations of officers are possible?

$4 \cdot 5 \cdot 2 \cdot 1 = 40$ combinations

2. A piggybank contains 2 quarters, 3 dimes, 4 nickels, and 5 pennies. One coin is removed at random.

a) What is the probability that the coin is a dime? $\frac{3}{14}$

b) What is the probability that the coin is a dime **or** a nickel? $\frac{3}{14} + \frac{4}{14} = \frac{7}{14}$ or $\frac{1}{2}$

c) What is the probability that you choose a nickel **and** then a nickel? (without replacement) $\frac{4}{14} \cdot \frac{3}{13} = \boxed{\frac{6}{91}}$

d) What is the probability that the coin is not a quarter? $\frac{12}{14} = \boxed{\frac{6}{7}}$

3. Each of the letters of the word "ALGEBRA " is on a separate card. The cards have been mixed and placed in a box. If you select one card at random, what is the probability that its letter will be "A"?

$\frac{2}{7}$

4. A card is randomly selected from a standard deck of 52 cards. Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Face card) $\frac{12}{52} = \boxed{\frac{3}{13}}$

b) P(Ace or a Diamond) $\frac{4}{52} + \frac{13}{52} - \frac{1}{52} = \frac{16}{52} = \boxed{\frac{4}{13}}$

c) P(Black and Ace) looking for the overlap $\frac{2}{52}$ or $\boxed{\frac{1}{26}}$

d) P(Black card or Face card) $\frac{26}{52} + \frac{12}{52} - \frac{6}{52} = \frac{32}{52} = \boxed{\frac{8}{13}}$

5. Two cards are randomly selected from a standard deck of 52 cards (WITH REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack and Heart)

$\frac{4}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{52}}$

b) P(Diamond and Diamond and Diamond)

$\frac{13}{52} \cdot \frac{13}{52} \cdot \frac{13}{52} = \boxed{\frac{1}{64}}$

c) P(Red and King)

$\frac{26}{52} \cdot \frac{4}{52} = \boxed{\frac{1}{26}}$

d) P(Black card and Numbered card)

$\frac{26}{52} \cdot \frac{36}{52} = \boxed{9/26}$

6. Two cards are randomly selected from a standard deck of 52 cards (**WITHOUT** REPLACEMENT). Find the indicated probability. **Hint: There are 4 jacks, 4 queens, 4 kings, 4 aces, 13 diamonds, 13 spades, 13 clubs, 13 hearts, 36 numbered cards, 26 red cards, and 26 black cards.**

a) P(Jack of Hearts and Heart)

$\frac{1}{52} \cdot \frac{12}{51} = \boxed{\frac{1}{221}}$

b) P(Face card and Face card and Ace)

$\frac{12}{52} \cdot \frac{11}{51} \cdot \frac{4}{50} = \boxed{\frac{22}{5525}}$

d) P(Black Card and Red King)

$\frac{26}{52} \cdot \frac{2}{51} = \boxed{\frac{1}{51}}$

d) P(Black Jack and Numbered card)

$\frac{2}{52} \cdot \frac{36}{51} = \boxed{\frac{6}{221}}$

0.47

7. The probability that a student plays tennis is 47%. The probability that a student plays tennis and Lacrosse is 16%. What is the probability that student plays Lacrosse, given that they play tennis?

0.16

$\frac{0.16}{0.47} = \boxed{0.34}$

8. The probability that a high school senior drives to school is .81. The probability that a high school senior having a job and driving to school is .52. What is the probability that high school senior will have a job, given that they drive to school?

$\frac{0.52}{0.81} = \boxed{0.64}$

For #9 - 13, refer to the following table.

	Male	Female	Subtotal
Blue Eyes	40	20	60
Green Eyes	10	80	90
Subtotal	50	100	150

9) P (Male) = $\frac{50}{150} = \frac{1}{3}$

10. P (Green Eyes) = $\frac{90}{150} = \boxed{\frac{3}{5}}$

11.P(Green Eyes | Male) =

denominators

$\frac{10}{50}$ or $\boxed{\frac{1}{5}}$

12. P(Male | Green Eyes) = $\frac{10}{90} = \boxed{\frac{1}{9}}$

13) Male and Green eyes are dependent

$P(M|G) \neq P(G|M)$