

## 2<sup>nd</sup> Semester Algebra 2 Notes Practice Problems

### 9-7 Probability of Multiple Events

$P(A) = \frac{1}{4}$ ,  $P(B) = 60\%$ ,  $P(C) = 0.20$  (A, B & C are independent events)

- 1) P(A and B)                      2) P(B or C) if Mutually Exclusive                      3) P(A or C) if **not** Mutually Exclusive

5 Large Blue Marbles, 2 Large Green Marbles, 3 Small Blue, and 2 Small Green Marbles

- 4) P(Large or Blue)                      5) With Replacement: P(a Blue then a Large)  
6) Without Replacement: P(Two Green)                      7) Without Replacement: P(a Blue then a Green)

### 12-2 Conditional Probability

P(B | A) = Probability of event B, given event A

	Male	Female	1) P(Female)	2) P(Sophomore   Female)
Freshmen	4	0	3) P(Female   Sophomore)	4) P(Sophomore   Junior)
Sophomore	6	1		
Juniors	1	5		
Seniors	0	3		

Survey: 30% of the people were left-handed, 40% of the left-handed people are males, and 20% of the right-handed people are females.

- 5) P(male | left-handed)                      6) P(left-handed female)

### 12-4 Standard Deviation

1. Standard Deviation: 6, 11, 10  
2. Which of the following set of data will probably have the **largest** standard deviation and which will have the **smallest**?  
a) 13, 25, 1, 5, 7, 12                      b) 6, 1, 4, 3, 5, 1                      c) 80, 75, 30, 41, 2, 1                      d) 18, 20, 37, 31  
3. Variance: 8, 2, 7, 3

### Exponent Properties

$3x^3 \cdot 7x^6 =$	$(-x^8y)(2x^9y^7) =$	$(x^6)^3 =$	$4x^{12}(x^5)^3 =$
$\frac{x^9}{x^3} =$	$\frac{16x^6y^{11}}{10x^5y^7} =$	$\frac{x^7}{x^9} =$	$8^{-2} =$ $-7x^{-8}y^4 =$
$(3x)^4 =$	$(2x^5y^{-7})^{-3} =$	$\left(\frac{2x}{3}\right)^3 =$	$\left(\frac{x^8}{y^3}\right)^{-2} =$
$\frac{x^{12}}{3x^{12}} =$	$-3xy^0 =$	$(5xy^6)^0 =$	

### Radical Expressions and Rational Exponents

1. Simplify and rewrite in radical notation: $x^{10/16}$	2. Simplify and rewrite in rational exponent notation: $\sqrt[6]{x^{14}}$	3. Simplify: $16^{3/2}$
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### 7-5 Solving Square Roots

Solve:  $3\sqrt{5} - 2x - 4 = 11$

## Chapter 8 Exponential and Logarithmic Functions

### 8-1 Exploring Exponential Models

1) Sketch: $f(x) = 10(2)^x$	2) Sketch: $y = 20\left(\frac{1}{2}\right)^x$
<u>Determine if they are Exponential Growth or Decay:</u> 3) $y = \frac{3}{2}\left(\frac{3}{4}\right)^x$ 4) $y = 1.9^x$ 5) $y = 0.3(.5)^x$	
6) You own a \$200,000 home and it is increasing in value at about 3% each year. a) Write the function.                      b) Write an equation for how much it will be worth in 8 years? 7) Monsters presently cost \$2. Deflation decreases the cost of things by about 5% each year. a) Write the function.                      b) Write an equation for how much it will cost in 20 years?	

### 8-3 Logarithmic & Exponential Transformations

1) Write as a log: a) $4^2 = 16$ b) $\frac{1}{125} = 5^{-3}$	2) Write as an exp: a) $\log_6 36 = 2$ b) $\log 0.01 = -2$
3) Solve: a) $\log_4 64$	b) $\log_7\left(\frac{1}{49}\right)$ c) $\log 1000$

### 8-4 Properties of Logarithms

1) Condense: a) $3\log x - \log 5 - 2\log y$	b) $4\log y + \frac{1}{3}(\log 8 + \log 27)$
2) Expand: a) $\log_6\left(\frac{36y}{x^6}\right)$	b) $\log_4 2(6x)^2$
3) Evaluate: $3\log_3 9 - \log_5 125$	4) Given: $\log 5 \approx 0.7$ and $\log 6 \approx 0.8$ Find: $\log\left(\frac{36}{5}\right)$

### 8-5 Exponential and Logarithmic Equations

1) $22 - 3(5)^{1-2x} = 1$	2) $125^{x+7} = 25^{4x-2}$	3) $3\log_2(3+4x) + 1 = 19$	4) $\log(x-3) + \log x = 1$
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### 8-6 Natural Logarithms

1) Condense: $2\ln 7 + 3\ln x - \frac{1}{3}\ln y$	2) Simplify: $32 - 4\ln e^2$	
Solve: 3) $2 + \ln\sqrt{3n-2} = 5$	4) $3e^{1-5x} + 1 = 7$	5) $\ln(x+1) - \ln 3x = 0$
6) You put \$1000 in a bank account and it will be worth \$3000 in 12 years. What type of interest rate are you getting if interest is compounded continuously?		

### Chapter 9 Rational Functions

#### Fractions

1) $\frac{3}{2} \cdot \frac{4}{9}$	2) $\frac{2}{30} \div \frac{4}{15}$	3) $\frac{3}{8} - \frac{1}{6}$	4) $\frac{3}{4} + \frac{5}{8}$
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#### Factoring

1) $6x^4 - 21x^2$	2) $6x^2 - 11x - 10$	3) $x^2 + xy - 12y^2$	4) $3x^2 - 30x + 48$
5) $49x^8 - y^4$	6) $25x^2 + 40x + 64$	7) $216 - x^3$	8) $125x^{12} + 8y^3$

#### 9-4 Rational Expressions

1) $\frac{(-7x^{-6}y^{-1})^2}{14x^4y^2}$	2) $\frac{4x^2 - 4}{5x + 5}$	3) $\frac{3x^{-6}}{4y^3} \div \frac{12y^{-2}}{10x}$
4) $\frac{4-x^2}{4x} \div \frac{3x-6}{x^2+2x}$	5) $\frac{x-2}{x^2-x-2} \cdot (1-x)$	6) $\frac{30x^5}{x^2-25} \div \frac{6x^5}{2x-10}$

#### 9-5 Adding and Subtracting Rational Expressions

1) $\frac{8x^2}{2x} - \frac{6x}{2x}$	2) $\frac{x^2+2}{x^2-2x-15} - \frac{1}{x+3}$	3) $\frac{2}{x^2+5x+4} + \frac{x-1}{x^2-16}$
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#### 9-6 Solving Rational Equations

1) $\frac{x-3}{x+1} = \frac{3}{x+2}$	2) $\frac{3x}{10} - 2 = \frac{1}{5x}$	3) $\frac{2}{x^2-2x-3} - \frac{3}{x+1} = \frac{1}{x-3}$
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### Chapter 11 – Sequences and Series

#### 11-2 Arithmetic Sequences

Is the sequence arithmetic? If so, identify the common difference.		
1) -3, 1, 5, ...	2) 6, 2, -1, ...	3) 2, 4, 8, ...
4) Write an equation for the sequence: -20, -15, -10, ...	5) Find the 12 <sup>th</sup> term of the sequence: 18, 11, 4, ...	6) Find the 8 <sup>th</sup> term of the sequence: $a_{10} = 18, d = 3$

#### 11-3 Geometric Sequences

What type of sequence? If it is geometric, then what is the common ratio and the next 2 terms.		
1) 3, 6, 9, ...	2) -6, 12, -24, ...	3) 9, 3, 1, ...
4) Write an equation for the sequence. Generate the first 5 terms: $a_1 = 3, r = 4$	5) Find the 9 <sup>th</sup> term of the sequence: $a_7 = 5, r = 3$	6) Find the 10 <sup>th</sup> term of the sequence: $a_{12} = -12, r = -2$

### 11-4 Arithmetic Series

Tell if it is a *sequence* or *series*. Tell if it is *infinite* or *finite*.

1) 17, 15, 13, ...

2)  $3 + 5 + 7 + 9 + \dots$

3)  $3 + 2 + 1$

4) Write the related series. Evaluate the series: -1, 4, 9, 14

5) The sequence has 7 terms. Evaluate the series: -12, -9, ..., 6

6) Evaluate the series to the 10<sup>th</sup> term:  $2 + 6 + 10 + \dots$

### 11-5 Geometric Series

1) Evaluate for the specified number of terms:

$-1 + 4 - 16 + \dots$ ;  $n = 6$

Which series have a sum?

2)  $2 + 8 + 32 + \dots$

3)  $150 + 15 + 1.5 + \dots$

4) Evaluate the infinite geometric series:  $30 + 10 + \frac{10}{3} + \dots$

5) Is the series *arithmetic* or *geometric*? Evaluate for the specified number of terms.  $-2 + 10 - 50 + \dots$ ;  $n = 5$

## Chapter 10 – Quadratic Relations and Conic Sections

### 10-2 Parabolas

1) Identify the focus and directrix.  $x = -12y^2$

2) Identify the focus and directrix.  $y = \frac{1}{4}x^2$

3) Sketch the graph and identify the vertex, focus, and directrix:  $x = -\frac{1}{8}y^2$

4) Sketch the graph and identify the vertex, focus, and directrix:  $x^2 = 16y$

### 10-3 Circles

1) Graph:  $(y + 3)^2 + (x + 2)^2 = 16$

2) Find the center and radius:  $(x - 1)^2 + (y + 5)^2 = 30$

### 10-4 Ellipses

1) Graph and label the foci:  $\frac{x^2}{9} + \frac{y^2}{36} = 1$

2) Find the foci:  $14x^2 + 4y^2 = 28$

### 10-5 Hyperbolas

1) Graph and label the foci:

$\frac{x^2}{64} - \frac{y^2}{25} = 1$

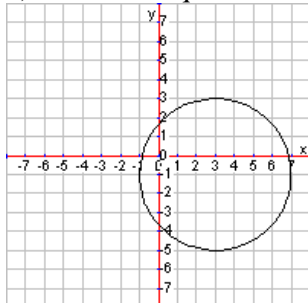
2) Graph:  $16y^2 - 4x^2 = 16$

3) Find the vertices and asymptotes:

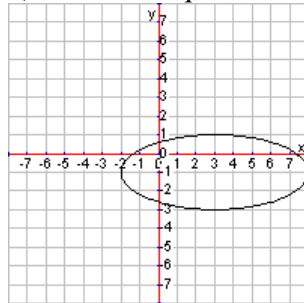
$9y^2 - 4x^2 = 36$

### 10-6 Translating Conic Sections

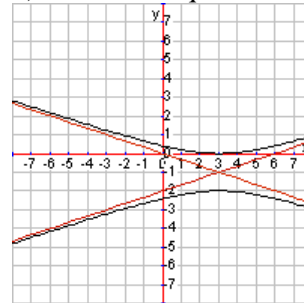
1) Write the equation:



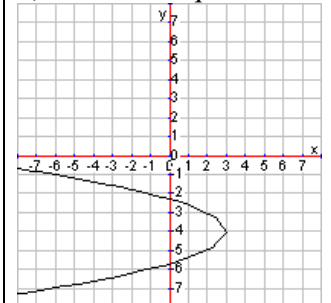
2) Write the equation:



3) Write the equation:



4) Write the equation:



5) Write the equation for an ellipse with a center at (-2, -3) and a horizontal major axis of 10 and a vertical minor axis of 8.

Classify the conic. Change it into standard form and then graph it. Find the center/vertex. Find and label foci and/or other important points on the graph

6)  $x^2 + y^2 - 2x - 8y = -13$

7)  $-4y^2 + 25x^2 - 100x = 0$

8)  $25x^2 + y^2 - 100x - 2y = -76$

9)  $4x^2 - 24x - y + 37 = 0$