Date: _____ **Instructors:** Peter Curley, Channing Hodgkins, Jared Lyons

Student Name/ID#: _____

Total Score: / 100

ARCHBISHOP WILLIAMS HIGH SCHOOL - AWHS SUMMER MATH ASSIGNMENTS: SECTION 1

Students Entering PRECALCULUS (All levels) - Summer Assignment

QUESTION 1 /1

Topic Resource: Evaluating Expressions

Evaluate the algebraic expression for the given value: $x^2 - 3\left(x - y\right),\ for\ x = 8\ and\ y = 2$

A ☐ -366 **B** ☐ 46

C ☐ 366 **D** ☐ 82

QUESTION 2 /1

Topic Resource: Unions and Intersections

Find the intersection of the set: $\{1,\ 2,\ 3,\ 4\} \cap \{2,\ 4,\ 5\}$

A ☐ $\{1,\ 2,\ 3,\ 4,\ 5\}$ **B** ☐ $\{1,\ 3,\ 5\}$

C ☐ $\{1,\ 3\}$ **D** ☐ $\{2,\ 4\}$

QUESTION 3 /1

Topic Resource: Order of Operations

Simplify the algebraic expression: $18x^2 + 4 - \left[6\left(x^2 - 2\right) + 5\right]$

/1

QUESTION 4

Topic Resource: Order of Operations

Use order of operations to simplify the expression: $\frac{12\div3\cdot5|2^2+3^2|}{7+3-6^2}$

QUESTION 5

/1

Topic Resource: Writing Expressions

Write each English phrase as an algebraic expression. Then simplify the expression.

The difference between the product of six and a number and negative two times the number

QUESTION 6

/1

Topic Resource: Properties of Exponents

Simplify the exponential expression. Assume that variables represent nonzero real numbers.

$$\frac{\left(2^{-1}x^{-3}y^{-1}\right)^{-2}\left(2x^{-6}y^{4}\right)^{-2}\left(9x^{3}y^{-3}\right)^{0}}{\left(2x^{-4}y^{-6}\right)^{2}}$$

A $\frac{x^{26}y^{6}}{4}$

B $\frac{4}{x^{26}y^{6}}$

C $2x^{28}y^{4}$

D $\frac{1}{x^{28}y^{4}}$

QUESTION 7 /1

Topic Resource: Simplifying Radical Expressions

Evaluate the expression.

$\sqrt{144} + \sqrt{25}$

A ☐ 84.5

B ☐ 17

C ☐ 13

D ☐ 77

QUESTION 8 /1

Topic Resource: Simplifying Radical Expressions

Simplify the expression.

$$\frac{\sqrt{500x^3}}{\sqrt{10x^{-1}}}$$

A ☐ $x\sqrt{10}$

B ☐ $5x^2\sqrt{2}$

C ☐ $50x^2$

D ☐ $5\sqrt{2x^4}$

QUESTION 9 /1

Topic Resource: Simplifying Radical Expressions

Add or subtract terms whenever possible.

$3\sqrt{54} - 2\sqrt{24} - \sqrt{96} + 4\sqrt{63}$

QUESTION 10 /1

Topic Resource: Adding and Subtracting Polynomials

Simplify the expression.

$(8x^2 + 7x - 5) - (3x^2 - 4x) - (-6x^3 - 5x^2 + 3)$

A ☐ $33x^{11} - 2$

B ☐ $6x^3 + 11x - 8$

C ☐ $-6x^3 + 16x^2 + 3x - 2$

D ☐ $6x^3 + 10x^2 + 11x - 8$

QUESTION 11

/1

Topic Resource: Multiplying Polynomials

Find the product.

$(x - 3)^2$

A ☐ $x^2 + 9$

B ☐ $x^2 - 9$

C ☐ $x^2 - 6x + 9$

QUESTION 12

/1

Topic Resource: Multiplying Polynomials

Find the product.

$(7x^2 - 2)(3x^2 - 5)$

QUESTION 13

/1

Topic Resource: Multiplying Polynomials

Find the product.

$(5x + 1 + 6y)^2$

QUESTION 14 /1

Topic Resource: Factoring Polynomials

Factor the trinomial:

$9x^2 + 5x - 4$

QUESTION 15 /1

Topic Resource: Factoring Polynomials

Factor:

$36x^2 - 49y^2$

QUESTION 16 /1

Topic Resource: Factoring Polynomials

Factor using the formula for the sum of two cubes:

$64x^3 + 27$

QUESTION 17 /3

Topic Resource: Factoring Polynomials

Your friend attempted to factor an expression as shown. Find the error in your friend's work. Explain the error and factor the expression correctly.

$2x^2 - 7x + 5$
$2x^2 - 5x - 2x + 5$
$x(2x - 5) + (2x - 5)$
$(x + 1)(2x - 5)$

QUESTION 18 /1

Topic Resource: Rational Equations

Solve the linear equation:

$5 + \frac{(x-2)}{3} = \frac{(x+3)}{8}$

QUESTION 19

/3

Topic Resource: Factoring Quadratics

A classmate solves the quadratic equation as shown. Explain the error your classmate made. What are the correct solutions?

$x^2 + 5x + 6 = 2$
$(x + 2)(x + 3) = 2$
$x = -2$ or $x = -3$

QUESTION 20

/1

Topic Resource: Solving Literal Equations

Solve the formula for f_2:

$$f = \frac{f_1 f_2}{f_1 + f_2}$$

QUESTION 21

/2

Topic Resource: Absolute Value Equations

Solve the absolute value equation:

$3|2x - 1| = 21$

A ☐ $\{-3, 3\}$

B ☐ $\{-3\}$

C ☐ $\{-4, 4\}$

D ☐ $\{-3, 4\}$

QUESTION 22

/1

Topic Resource: Quadratic Equations

Solve the quadratic equation:

$2x^2 + 5x = 3$

QUESTION 23

/1

Topic Resource: Solving Radical Equations

Solve the equation:

$\sqrt{2x + 15} - 6 = x$

A ☐ {9}

B ☐ $\{3\}$

C ☐ $\{-3\}$

D ☐ $\{-3, 3\}$

QUESTION 24

/1

Topic Resource: Absolute Value Inequalities

Solve the linear inequality:

$|\frac{3(x-1)}{4}| < 6$

A ☐ $(-9,\ -7)$

B ☐ $(7,\ 9)$

C ☐ $(-7,\ 9)$

D ☐ $(-7,\ 9)$

QUESTION 25

/1

Topic Resource: Writing Linear Equations

Use the given coordinates to write an equation for the line in slope-intercept form:

Passing through $(-3,\ -2)$ **and** $(3,\ 6)$

QUESTION 26

/1

Topic Resource: Writing Linear Equations

Write an equation in slope-intercept form of a linear function *f* whose graph satisfies the given condition:

The graph of *f* is perpendicular to the line whose equation is $4x - y - 6 = 0$ **and has the same y-intercept as this line.**

QUESTION 27

/3

Topic Resource: Solving Quadratic Equations

A ball is thrown upward and outward from a height of 6 feet. The height of the ball, $f(x)$, in feet, can be modeled by $f(x) = -0.8x^2 + 3.2x + 6$, where *x* is the ball's horizontal distance, in feet, from where it was thrown.

a) What is the maximum height of the ball?

b) How far from the where it was thrown does the maximum height occur?

c) How far does the ball travel horizontally before hitting the ground? (Round to the nearest foot)

QUESTION 28 /1

Topic Resource: Dividing Polynomials (Long Division)

Divide using long division:

$\left(x^3 + 5x^2 + 7x + 2\right) \div (x + 2)$

QUESTION 29 /1

Topic Resource: Dividing Polynomials (Synthetic Division)

Divide using synthetic division:

$\left(5x^2 - 12x - 8\right) \div (x + 3)$

QUESTION 30

/1

Topic Resource: Solving Equations with Variables on Both Sides

Solve the equation:

$$25-[2+5x-3(x+2)]=-3(2x-5)-[5(x-1)-3x+3]$$