Algebra 2 –Unit 7 Review

Name _____

1.) What is the product of $(x + 2y + 2z)$ and $(2z^2 + 4)$?

$(x+2y+2z)(2z^2+4)$

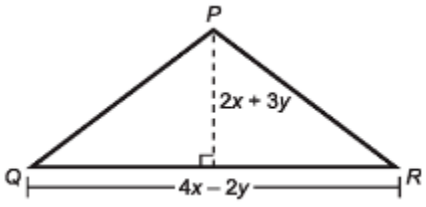
$2z^2x+4y2^2+4z^3+4x+8y+8z$

2.) What is the product of $(x^3 - 3y^2 + 6xy + 3)$ and $(-3xy)$?

$-3x^4y+9xy^3-18x^2y^2-9xy$

3.) Joan designed a triangular banner with these dimensions.

Which expression describes the area of the banner represented by ΔPQR?



$\frac{1}{2}(4x-2y)(2x+3y)$

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

$2x^2+6xy-2xy-3y^2$

$4x^2+4xy-3y^2$

4.) Simplify the expression $(-3xy^4)(5x^3y^2)$.

$-15x^4y6$

5.) What is one way to factor: $-18x^8 + 27x^{15}$?

$9x^8(2+3x^7)$

6.) Which expression is a perfect square trinomial?

$121x^2 + 66x + 9$
$144x^2 + 60x + 25$
$169x^2 + 208x + 16$
$125x^2 + 200x + 16$

9.) Completely factor: $x^2 - x - 42$?

$(x-7)(x+6)$

10.) What is the complete factorization of: $2x^2y - 26xy - 60y$?

$2y(x^2-13x-30)$
$2y(x-15)(x+2)$

11.) A blueprint shows a rectangular basement with an area of $2x^2 - 9x - 5$. If the width of the basement is $x - 5$, what is the length of the basement?

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

12.) What is the complete factorization of: $25x^2 + 40x + 15$?

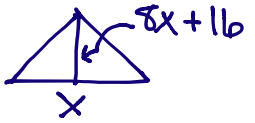
375 | 15, 25
40 | 40

$25x^2+25x+15x+15$
$25(x+1)+15(x+1)$
$(25x+15)(x+1)$

13.) Karen correctly solved $x^2 + 3x = 18$ using the factoring method. What solutions did Karen find?

$x^2+3x-18=0$
$(x-3)(x+6)=0$
$x=3 \quad x=-6$

14.) The height of a triangle is 16 inches greater than 8 times the length of its base. If the area of the triangle is 60 in^2, what is the length of the base, in inches?



$60=\frac{1}{2}x(8x+16)$
$60=4x^2+8x$
$0=4x^2+8x-60$

$4x^2=12x+20x-60$
$4x(x-3)20(x-3)$
$(4x+20)(x-3)=0$

$4x+20=0$
$4x=-20$
$x=-5$
$x=3$

15.) What are the solutions to $(3x - 1)^2 = 45$?

$9x^2-3x-3x+1=45$
$9x^2-6x+1=45$
$9x^2-6x-44=0$
$a=9 \quad b=-6 \quad c=-44$

$x=\frac{6\pm\sqrt{(-6)^2-4(9)(-44)}}{2(9)}$
$=\frac{6\pm\sqrt{36+1584}}{18}$
$=\frac{6\pm\sqrt{1620}}{18}$

16.) What are the solutions to $x^2 - 3x - 24 = 0$?

$a=1 \quad b=-3 \quad c=-24$
$\frac{3\pm\sqrt{(-3)^2-4(1)(-24)}}{2(1)}$
$\frac{3\pm\sqrt{9+76}}{2}$
$\frac{3\pm\sqrt{85}}{2}$

17.) What is the solution set for $5t^2 + 6 = 8t$?

$5t^2-8t+6=0$

$a=5\ b=-8\ C=6$

$\frac{8\pm\sqrt{(-8)^2-4(5)(6)}}{2(5)}$

$\frac{8\pm\sqrt{64-120}}{10}$

$\frac{8\pm\sqrt{-56}}{10}$

$\frac{8\pm 2i\sqrt{14}}{10}$

$\frac{4\pm i\sqrt{14}}{5}$

56
7 8
2 4

18.) What are the roots of this equation? $x^2 + 2x + 14 = 0$

$a=1\ b=2\ C=14$

$\frac{-2\pm\sqrt{4-4(1)14}}{2}$

$\frac{-2\pm\sqrt{4-56}}{2}$

$\frac{-2\pm\sqrt{-52}}{2}$

$\frac{-2\pm 2i\sqrt{13}}{2}$

$-1\pm i\sqrt{13}$

52
2 26
2 13

19.) What is the solution set of this equation? $\frac{2}{3}x^2+1=x-\frac{1}{2}$

$\frac{2}{3}x^2-x+1.5=0$

$a=\frac{2}{3}\ b=-1\ C=1.5$

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

$\frac{1\pm\sqrt{1-24/6}}{4/3}$

$\frac{1\pm\sqrt{1-4}}{4/3}$

$\frac{1\pm\sqrt{-3}}{4/3}$

$\frac{1\pm i\sqrt{3}}{(4/3)}=\frac{3\pm 3i\sqrt{3}}{4}$

20.) What are the solutions of $4x^2 = 3x - 2$?

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

$a=4\ b=-3\ C=2$

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

$\frac{3\pm\sqrt{9-32}}{8}$

$\frac{3\pm\sqrt{-23}}{8}$

$\frac{3\pm i\sqrt{23}}{8}$

21.) What are the solutions of: $(x + 1)^2 = -4$?

$x^2+2x+1=-4$

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

$a=1\ b=2\ C=5$

$\frac{-2\pm\sqrt{2^2-4(1)(5)}}{2(1)}$

$\frac{-2\pm\sqrt{4-20}}{2}$

$\frac{-2\pm\sqrt{-16}}{2}$

$\frac{-2\pm 4i}{2}$

$-1\pm 2i$

Target – I can use the discriminant to determine the number and type of solutions for a quadratic equation.

22.) For what values of c will $x^2 + 4x + c = 0$ have 2 complex conjugate roots?

b^2-4ac

$4^2-4c<0$

$16<4c$

$4<c$

23.) What condition will yield non-real solutions for the quadratic equation $ax^2 + bx + c = 0$?

$b^2-4ac<0$

Target – I can identify complex numbers, write their conjugates, and perform operations using complex numbers including simplifying quotients of complex numbers.

24.) What is the complex conjugate of $7+\sqrt{-8}$?

$7+2i\sqrt{2} \rightarrow 7-2i\sqrt{2}$

25.) Rationalize $\frac{1+i}{1-i}$ $\frac{1+i}{1+i} = \frac{1+2i+i^2}{1-i^2} = \frac{2i}{2} = i$

26.) What is the product of (4 – 3i) and (-7 – 2i)?

$-28-8i+21i+6i^2$

$-28+13i-6$

$-34+13i$

27.) What is the sum of 2i, -5 – 6i, and 7?

$2i-5-6i+7$

$2-4i$

28.) If c – d = 7 and c = 3 – 4i, what is the value of d?

$3-4i-d=7$

$-3 \quad -3$

$-4i-d=4$

$-d=4+4i$

$d=-4-4i$

29.) What is the first step in simplifying $\frac{2-2i}{-5+3i}$?

Mult. by $\frac{-5-3i}{-5-3i}$

30.) Write $\frac{9-i^2}{3-i}$ in standard form.

$\frac{9-i^2}{3-i}=\frac{9+1}{3-i}=\frac{10}{3-i}$ $\frac{10}{3-i}\frac{3+i}{3+i}=\frac{30+10i}{9-i^2}=\frac{30+10i}{10}$ $3+i$

Constructed Response

32.) Ethan needs to solve the equation $(16x^4 - 9)(x^2 + 10x + 25) = 0$

a.) Completely factor the left side of the equation. Explain your method to factor the expression in each set of parentheses.

b) Use your factored expression from Part A to find all the solutions to the equation, including real or imaginary solutions. Show your work algebraically, and explain how you found your answers.

A rectangular painting has dimensions $2x$ and $2x + 10$. The painting is in a frame 2 in. wide. The total area of the picture and the frame is 900 in.^{2}. What are the dimensions of the painting?

A ball is thrown upward from a height of 10 ft with an initial upward velocity of 5 ft/s. Use the formula $h = -16t^2 + vt + s$ to find how long it will take for the ball to hit the ground.

Your community wants to put a square fountain in a park. Around the fountain will be a sidewalk that is 5 ft wide. The total area that the fountain and sidewalk can be is 900 ft^2. What are the dimensions of the fountain?

The Garys have a triangular pennant of area 840 in.^{2} flying from the flagpole in their yard. The height of the triangle is 20 in. less than 10 times the base of the triangle. What are the dimensions of the pennant?