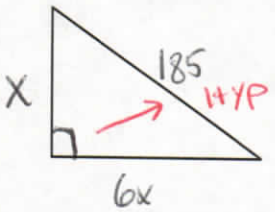
Right Triangle Problems

1)



$a^2 + b^2 = c^2$

$(x)^2 + (6x)^2 = (185)^2$

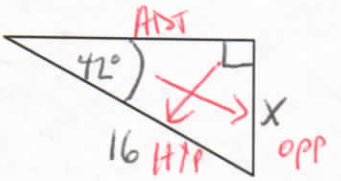
$x^2 + 36x^2 = 34{,}225$

$\frac{37x^2}{37} = \frac{34{,}225}{37}$

$\sqrt{x^2} = \sqrt{925}$

$x \approx 30.41$

2)



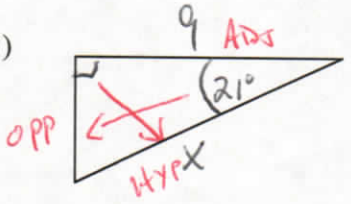
$\sin = \frac{OPP}{HYP}$

$\frac{\sin 42°}{1} = \frac{x}{16}$

$x = 16(\sin 42°)$

$x \approx 10.71$

3)



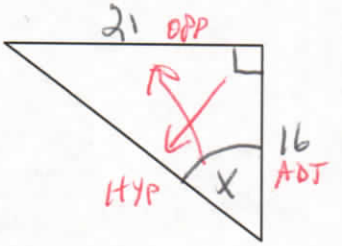
$\cos = \frac{ADJ}{HYP}$

$\frac{\cos 21°}{1} = \frac{9}{x}$

$\frac{9}{\cos 21°} = \frac{x(\cos 21°)}{\cos 21°}$

$9.64 \approx x$

4)



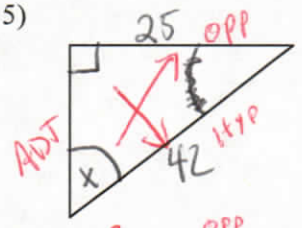
$\tan = \frac{OPP}{ADJ}$

$\tan x = \frac{21}{16}$

$\tan^{-1}(21/16) = x$

$52.70° \approx x$

5)



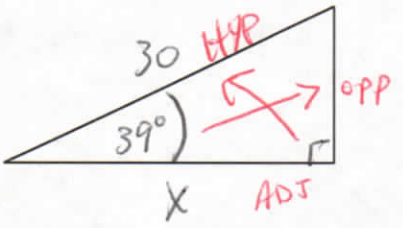
$\sin = \frac{OPP}{HYP}$

$\sin x = \frac{25}{42}$

$\sin^{-1}(25/42) = x$

$36.53^\circ = x$

6)



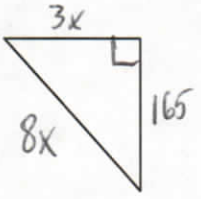
$\cos = \frac{ADJ}{HYP}$

$\frac{\cos 39^\circ}{1} = \frac{x}{30}$

$x = 30(\cos 39^\circ)$

$x \approx 23.31$

7)



$a^2 + b^2 = c^2$

~~$(8x)^2 + 165$~~

$(3x)^2 + (165)^2 = (8x)^2$

$9x^2 + 27,225 = 64x^2$

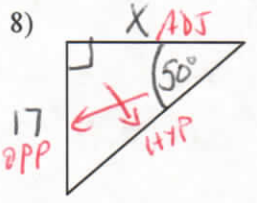
$-9x^2 \quad -9x^2$

$\frac{27,225}{55} = \frac{55x^2}{55}$

$\sqrt{495} = \sqrt{x^2}$

$22.25 \approx x$

8)



$\tan = \frac{OPP}{ADJ}$

$\frac{\tan 50^\circ}{1} = \frac{17}{x}$

$\frac{x(\tan 50^\circ)}{\tan 50^\circ} = \frac{17}{\tan 50^\circ}$

$x \approx 14.26$

Special Right Trig:

9) cos 90° = 0

10) tan x = 1

① RA = 45°

② QI	QIII
③ RA = θ	θ − 180° = RA
45° = θ	θ − 180 = 45°
	+180 +180
	θ = 225°

④ X = {45°, 225°}

11) sin 240° =

① QIII, Negative

② θ − 180 = RA

240 − 180° = RA

60° = RA

③ −SIN 60° = $-\sqrt{3}/2$

④ SIN 240° = $-\sqrt{3}/2$

12) tan 120° =

① QII Negative

② 180 − θ = RA

180 − 120° = RA

60° = RA

③ −TAN 60° = $-\sqrt{3}$

④ TAN 120° = $-\sqrt{3}$

13) sin x = 0

X = {0°, 180°}

14) cos x = - ½

① RA = 60°

② QII	QIII ← QIII
180° − θ = RA	θ − 180° = RA
180 − θ = 60	θ − 180° = 60
−180 −180	+180 +180
−θ = −120	θ = 240°
−1 −1	
θ = 120°	

X = {120°, 240°}

15) cos 135° = $-\sqrt{2}/2$

16) tan x = 0

$X = \{0°, 180°\}$

17) sin 315° = $-\sqrt{2}/2$

YOU STILL NEED TO SHOW ALL APPROPRIATE STEPS/WORK. BUT ALL THAT WORK IS SHOWN ON NUMBERS 9-14. ONLY THE ANSWERS WILL BE GIVEN FOR 15-26.

18) tan 225° = 1

19) sin x = - ½

$X = \{210°, 330°\}$

20) cos x = -1

$X = \{180°\}$

21) $\cos x = \sqrt{2}/2$

$X = \{45°, 315°\}$

22) $\tan 0° =$ 0

23) $\sin 135° =$ $+\sqrt{2}/2$

24) $\cos 120° =$ $-1/2$

25) $\tan x = -\sqrt{3}/3$

$X = \{150°, 330°\}$

26) $\sin x = 1$

$X = \{90°\}$

Multiplying Polynomials:

27) $(6x-7)^2$

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

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

$36x^2-42x-42x+49$

$36x^2-84x+49$

28) $(9x+2)^2$

$(9x+2)(9x+2)$

$9x+2$

$9x$	$81x^2$	$+18x$
$+2$	$+18x$	$+4$

$81x^2+36x+4$

★ When multiplying binomials you can use ① FOIL ② Double Distribute ③ Boxes. ★

29) $(5x-8)^3$

$(5x-8)(5x-8)(5x-8)$

$25x^2-40x-40x+64$

$(25x^2-80x+64)(5x-8)$

$25x^2-80x+64$

$5x$	$125x^3$	$-400x^2$	$+320x$
-8	$-200x^2$	$+640x$	-512

$125x^3-600x^2+960x-512$

30) $(10x+4)^3$

$(10x+4)(10x+4)(10x+4)$

$100x^2+40x+40x+16$

$(100x^2+80x+16)(10x+4)$

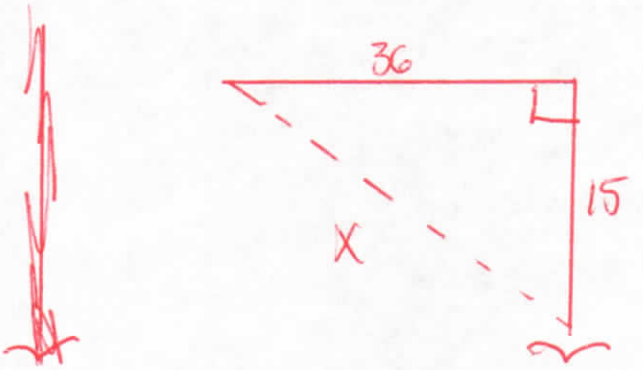
$100x^2+80x+16$

$10x$	$1,000x^3$	$+800x^2$	$+160x$
$+4$	$+400x^2$	$+320x$	$+64$

$1,000x^3+1,200x^2+480x+64$

Right Triangle Word Problems:

37) An eagle flies 15 miles north and then 36 miles west. How far is the bird from the starting point?



$a^2 + b^2 = c^2$

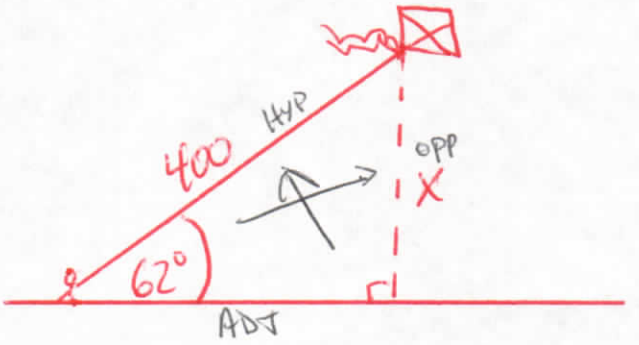
$(15)^2 + (36)^2 = (x)^2$

$225 + 1,296 = x^2$

$\sqrt{1,521} = \sqrt{x^2}$

39 miles = x

38) A boy is sitting on the floor flying a kite. He has 400 feet of string. The angle of elevation is 62°. How high is the kite?



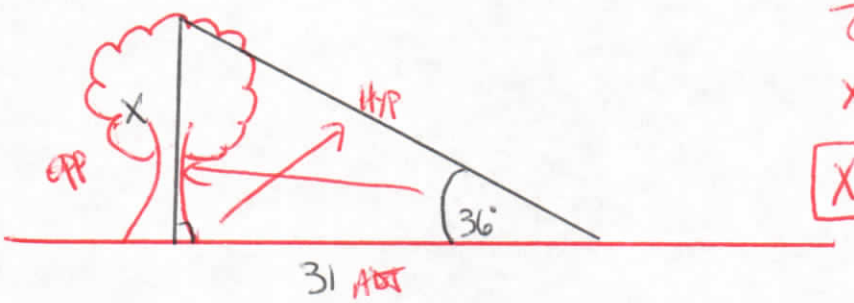
$\sin \theta = \frac{OPP}{HYP}$

$\frac{\sin 62^\circ}{1} = \frac{X}{400}$

$X = 400(\sin 62^\circ)$

$X \approx 353.18$ ft.

39) An apple tree casts a 31-foot shadow. If the angle of depression is 36°, how tall is the tree?



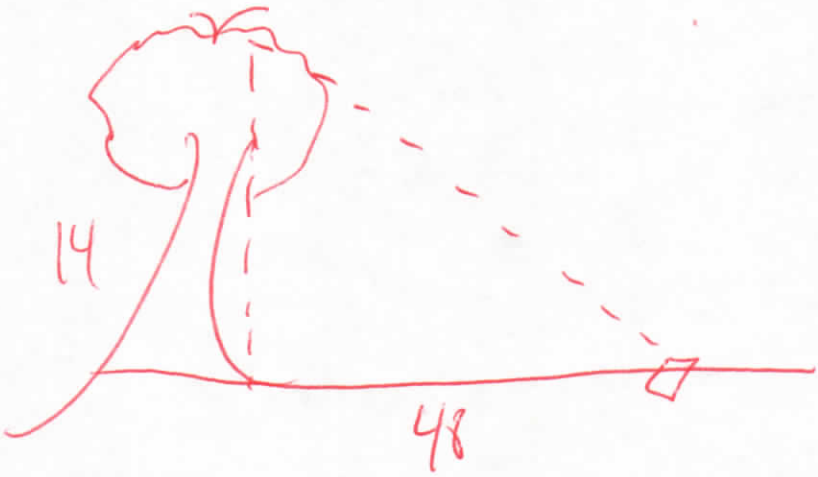
$\tan = \frac{OPP}{ADJ}$

$\frac{\tan 36^\circ}{1} = \frac{X}{31}$

$X = 31(\tan 36^\circ)$

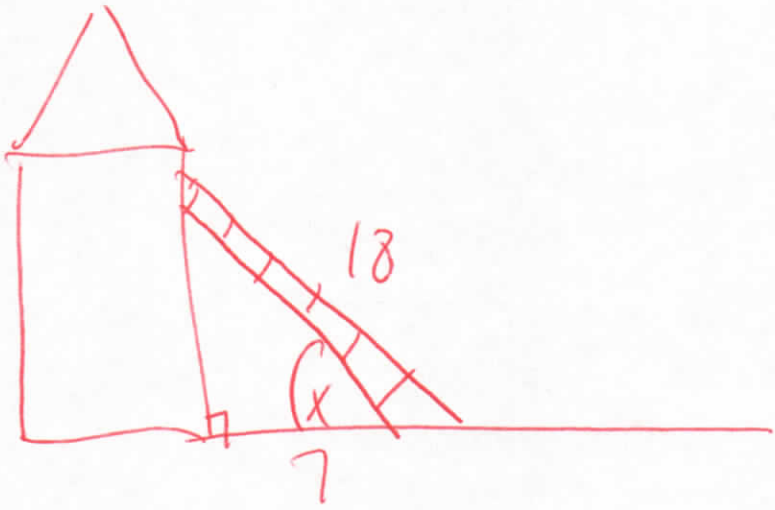
$X \approx 22.52$ ft.

40) A bird is perched on top of a 14-foot oak tree. It sees a piece of bread on the ground, 48 feet from the base of the tree. How far will the bird have to fly to get the piece of bread?



50 ft

41) A 18-foot ladder is leaning against a building. The base of the ladder is 7 feet away from the base of the building. Find the angle of elevation created by the ladder.



67.11°

42) $(-6x^{-4}y^{-5}z)^4$

$(-6)^4$

$1{,}296\,x^{-16}y^{-20}z^4$

$\frac{1{,}296\,z^4}{x^{16}y^{20}}$

43) $\frac{(8x^{15}y^{12}z^6)^2}{(2x^5y^4z^2)^6}$

$\frac{(8)^2}{(2)^6}$

$\frac{64x^{30}y^{24}z^{12}}{64x^{30}y^{24}z^{12}}$

$1\,x^0y^0z^0$

1

44) $6x(5x^2-3x-10)-10x(-3x^2+2x+6)$

$30x^3-18x^2-60x+30x^3-20x^2-60x$

$60x^3-38x^2-120x$

45) $8x(9x^2-8x+6)-12(6x^2+4x-9)$

$72x^3-64x^2+48x-72x^2-48x+108$

$72x^3-136x^2+108$

46) $(2a^5b^4c^8)^3(6a^{-11}b^{-12}c^{12})^2$

$(2)^3\quad(6)^2$

$(8a^{15}b^{12}c^{24})(36a^{-22}b^{-24}c^{24})$

$288\,a^{-7}b^{-12}c^{48}$

$\frac{288c^{48}}{a^7b^{12}}$

47) $\frac{84x^{11}y^{-3}z^8}{56x^7y^3z^9}$

$\frac{12}{7}x^4y^{-6}z^{-1}$

$\frac{12x^4}{7y^6z}$

48) $(-4d^5e^{-11}f^{-6})(-5d^{-7}e^{13}f^5)$

$20\,d^{-2}e^2f^{-1}$

$\frac{20e^2}{d^2f}$

Day 2:

Factoring:

Factor Each Completely:

1) $x^2 - 5x - 66$ F: -66 S: -5

$(x+6)(x-11)$

2) $x^2 + 11x - 12$

$(x+12)(x-11)$

3) $12x^2 - 7x - 5$

$(12x+5)(x-1)$

4) ~~$x^2 - 24x + 4144$~~

5) $3x^2 - 18x - 216$

$3(x^2-6x-72)$

$3(x+6)(x-12)$

6) $27x^2 + 9x - 6$

$3(9x^2+3x-2)$

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

7) $16x^2 - 25$

$(4x+5)(4x-5)$

8) $24x^2 + 62x + 5$

$(2x+5)(12x+1)$

9) $x^2 - 17x + 30$

$(x-15)(x-2)$

10) $144x^2 - 36$

$36(2x+1)(2x-1)$

11) $5x^9 - 320x^7$

$5x^7(x+8)(x-8)$

12) $4x^2 - 9$

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

13) $x^2 - 15x - 54$

$(x-6)(x-9)$

14) $35x^2 - 50x + 15$

$5(7x^2-10x+3)$

$5(x-1)(7x-3)$

15) $x^2 + 45x + 434$

$(x+14)(x+31)$

16) $x^2 + 7x - 588$

$(x+28)(x-21)$

17) $8x^3 + 24x^2 + 16x$

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

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

18) $49x^2 - 196$

$49(x+2)(x-2)$

19) $x^2 - 3x - 1{,}638$

$(x+39)(x-42)$

20) $x^2 - 30x + 104$

$(x-26)(x-4)$

21) $x^2 + 5x - 1{,}254$

$(x+38)(x-33)$

22) $x^2 + x - 2{,}070$

$(x+46)(x-45)$

23) $15x^2 - 105x + 180$

$15(x-3)(x-4)$

24) $20x^2 + 36x + 16$

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

$4x(x+1)(5x+4)$

Name _____

Alg1 Q1 Test 1 Test: Monday, 10/7/19

September 26, 2019
Due: 10/3/19

Multiplication and Division of Monomials:

29) $(4x^4y^{-3}z^6)^3$

$\frac{64x^{12}z^{18}}{y^9}$

30) $(2x^8y^{10}z^{-5})(5x^{-5}y^3z^2)^3$

$(2x^8y^{10}z^{-5})(125x^{-15}y^9z^6)$

$250x^{-7}y^{19}z^1$

$\frac{250y^{19}z}{x^7}$

31) $\frac{48x^7y^6z^8}{32x^5y^{-6}z^8}$

$\frac{3}{2}x^2y^{12}z^0$

$\frac{3x^2y^{12}}{2}$

35) $(-4x^2yz^{-9})^2(2x^{-4}y^4z^6)^3$

$(16x^4y^2z^{-18})(8x^{-12}y^{12}z^{18})$

$128x^{-8}y^{14}z^0$

$\frac{128y^{14}}{x^8}$

36) $\frac{(15x^6y^{12}z^{-10})^2}{(-5x^7y^{-6}z^9)^4}$

$\frac{225x^{12}y^{24}z^{-20}}{625x^{28}y^{-24}z^{36}}$

$\frac{9}{25}x^{-16}y^{48}z^{-56}$

$\frac{9y^{48}}{25x^{16}z^{56}}$

37) $\frac{(4x^{15}y^{-5}z^{10})^3}{(2x^9y^{-3}z^6)^5}$

38) $4x(12x^2 - 15x - 9) - 12x(4x^2 - 5x + 3)$

$48x^3 - 60x^2 - 36x - 48x^3 + 60x - 36x$

$-72x$

39) $5y^2(5y^3 - 4y^2 + 8y - 7) - 6y(3y^3 + 6y^2 - 5y - 9)$

$25y^5 - 20y^4 + 40y^3 - 35y^2 - 18y^4 - 36y^3 + 30y^2 + 54y$

$25y^5 - 38y^4 + 4y^3 - 5y^2 + 54y$