* REMEMBER $\sqrt{-1} = i$ *

Algebra II Unit 1 Quiz 2 Study Guide

Factor Completely.

1) $\frac{2x^2}{2} + \frac{66x}{2} + \frac{120}{2}$

$2(x^2+33x+60)$

2) $\frac{9x^2}{3} + \frac{75}{3}$

$3(3x^2+25)$

3) $\frac{2x^4y^2}{2xy^2} - \frac{4x^3y^3}{2xy^2} + \frac{8xy^4}{2xy^2} - \frac{12x^4y^5}{2xy^2}$

$2xy^2(x^3-2x^2y+4y^2-6x^3y^3)$

4) $(x+4)^2 - 81$

$(x+4+9)(x+4-9)$

$(x+13)(x-5)$

Solve.

5) $16x^2 = 25$

$\frac{16}{16} \quad \frac{16}{16}$

$\sqrt{x^2} = \sqrt{\frac{25}{16}}$

$x = \pm\frac{5}{4}$

6) $x^2 + 6x + 8 = 0$

8, 4, 2, 6

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

$x+4=0 \quad x+2=0$

$-4\ -4 \quad -2\ -2$

$x=-4 \quad x=-2$

7) $3x^2 = -12$

$\frac{3}{3} \quad \frac{3}{3}$

$\sqrt{x^2} = \sqrt{-4}$

$x = \pm 2i$

8) $9x^2 - 54 = 0$

$+54 \quad +54$

$\frac{9x^2}{9} = \frac{54}{9}$

$\sqrt{x^2} = \sqrt{6}$

$x = \pm\sqrt{6}$

9) $2x^2 + 36 = 0$

$-36 \quad -36$

$\frac{2x^2}{2} = \frac{-36}{2}$

$\sqrt{x^2} = \sqrt{-18}$

$2 \cdot 9$

$(3i)$

$x = \pm 3i\sqrt{2}$

10) $x^2 - 10 = 0$

$+10 \quad +10$

$\sqrt{x^2} = \sqrt{10}$

$x = \pm\sqrt{10}$

11) $x^2 - 9x + 18 = 0$

18, -6, -3, -9

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

$x-6=0 \quad x-3=0$

$+6\ +6 \quad +3\ +3$

$x=6 \quad x=3$

Grouping

12) $2x^2 - 3 = x$

$-x \quad -x$

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

-6, -3, 2, -1

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

$\frac{2x}{2x} \quad \frac{-3}{-3}$

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

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

$x+1=0 \quad 2x-3=0$

$x=-1 \quad +3\ +3$

$2x=3$

$x=3/2$

13) $3x^2 + 12x = 0$

$3x(x+4)=0$

$\frac{3x}{3}=\frac{0}{3} \quad x+4=0$

$x=0 \quad x=-4$

Slip & Divide

14) $3x^2 - 16x - 12 = 0$

$(x-\frac{18}{3})(x+\frac{2}{3})=0$

-36, 2, -18, -16

$(x-6)(3x+2)=0$

$x-6=0 \quad 3x+2=0$

$x=6 \quad -2\ -2$

$3x=-2$

$x=-2/3$

15) $x^2 - 5x = 0$

$x(x-5)=0$

$x=0 \quad x-5=0$

$x=5$

16) $9x^2 - 16 = 0$

$+16 \quad +16$

$\frac{9x^2}{9} = \frac{16}{9}$

$\sqrt{x^2} = \frac{\sqrt{16}}{\sqrt{9}}$

$x = \pm\frac{4}{3}$

17) $25x^2 - 15x = 0$

$5x(5x-3)=0$

$\frac{5x}{5}=\frac{0}{5}$ $\quad 5x-3=0$

$x=0$ $\quad +3\ +3$

$\frac{5x}{5}=\frac{3}{5}$

$x=\frac{3}{5}$

18) $4x^2 + 8 = 0$

$-8\ -8$

$\frac{4x^2}{4}=\frac{-8}{4}$

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

$x=\pm i\sqrt{2}$

19) $x^2 + 8x = -16$

$+16\ +16$

$x^2+8x+16=0$

16 : 4, 4 : 8

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

$x=-4,-4$

Grouping

20) $3x^2 - 7x + 2 = 0$

6 : −6, −1 : −7

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

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

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

$x-2=0$ $\quad 3x-1=0$

$x=2$ $\quad +1\ +1$

$\frac{3x}{3}=\frac{1}{3}$

$x=\frac{1}{3}$

21) $5x^2 - 80 = 0$

$+80\ +80$

$\frac{5x^2}{5}=\frac{80}{5}$

$\sqrt{x^2}=\sqrt{16}$

$x=\pm 4$

Slip & Divide

22) $6x^2 + 7x - 3 = 0$

$(x+9)(x-2)=0$

$\frac{9}{6}\ \ \frac{-2}{6}$

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

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

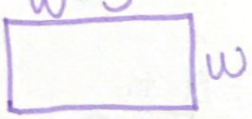
$2x+3=0$ $\quad 3x-1=0$

$-3\ -3$ $\quad +1\ +1$

$\frac{2x}{2}=\frac{-3}{2}$ $\quad \frac{3x}{3}=\frac{1}{3}$

$x=-\frac{3}{2}$ $\quad x=\frac{1}{3}$

23) The length of a rectangle is 3ft less than the width. The area is 40ft². What is the width and the length of the rectangle?



$A=lw$

$40=(w-3)w$

$40=w^2-3w$

$-40\ \ -40$

$0=w^2-3w-40$

−40 : −8, 5 : −3

$0=(w-8)(w+5)$

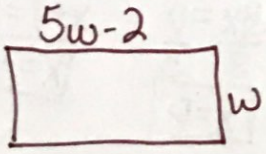
$w-8=0$ $\quad w+5=0$

$+8\ +8$ $\quad -5\ -5$

$w=8$ $\quad w=-5$

Width 8ft
Length 5ft

24) The length of a picture is two less than five times the width. If the area is 39 cm², what is the length and width of the picture?



$A=lw$

$39=(5w-2)w$

$39=5w^2-2w$

$-39\ \ -39$

$0=5w^2-2w-39$

−195 : −15, 13 : −2

Grouping

$0=(5w^2-15w)+(13w-39)$

$0=5w(w-3)+13(w-3)$

$0=(w-3)(5w+13)$

$w-3=0$ $\quad 5w+13=0$

$+3\ +3$ $\quad -13\ -13$

$w=3$ $\quad \frac{5w}{5}=\frac{-13}{5}$

$w=-\frac{13}{5}$

Width 3 cm
Length 13 cm