

Algebra II Unit 1 Quiz 2 Study Guide

Factor Completely.

1) $2x^2 + 66x + 120$

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

2) $9x^2 + 75$

$3(3x^2 + 25)$

3) $2x^4y^2 - 4x^3y^3 + 8xy^4 - 12x^4y^5$

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

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

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

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

Solve.

5) $16x^2 = 25$

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

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

$\frac{8}{4} \frac{2}{6} = 2$

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

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

$x = -4, -2$

7) $3x^2 = -12$

$\frac{3}{3} \frac{x^2}{3} = \frac{-12}{3}$
 $\sqrt{x^2} = \sqrt{-4}$

$x = \pm 2i$

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

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

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

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

$\frac{2x^2}{2} = \frac{-36}{2}$
 $\sqrt{x^2} = \sqrt{-18}$
 $2 \sqrt{9}$

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

10) $x^2 - 10 = 0$

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

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

$\frac{18}{-6} \frac{-3}{-9}$

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

$x = 6, 3$

$\frac{-6}{-3} \frac{2}{1}$

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

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

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

$3x(x+4) = 0$
 $\frac{3x}{3} = \frac{0}{3}$ $x = -4$
 $x = 0$

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

$\frac{-36}{-18} \frac{2}{-16}$

$(3x^2 - 18x) + (2x - 12) = 0$

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

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

$x = 6, -\frac{2}{3}$

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

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

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

$\frac{9x^2}{9} = \frac{16}{9}$
 $\sqrt{x^2} = \sqrt{\frac{16}{9}}$
 $x = \pm \frac{4}{3}$

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

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

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

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

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

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

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

$\frac{16}{4} / \frac{4}{8}$

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

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

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

$x = -4, -4$

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

$\frac{6}{-6} / \frac{-1}{-1}$ $(3x^2 - 6x) - (x + 2) = 0$

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

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

$x = 2, \frac{1}{3}$

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

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

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

$x = \pm 4$

$\frac{-18}{9} / \frac{-2}{7}$

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

$(6x^2 + 9x) - (2x - 3) = 0$

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

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

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

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?

$A = lw$

$40 = (w-3)w$

$40 = w^2 - 3w$

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

$\frac{-40}{-8} / \frac{5}{3}$

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

$w = 8, -5$

$w = 8$

$l = 8 - 3 = 5$

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?

$A = lw$

$39 = (5w-2)w$

$39 = 5w^2 - 2w$

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

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

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

$\frac{-195}{-15} / \frac{13}{-2}$

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

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

$w = 3$ $l = 5(3) - 2$
 $l = 13$

width 3cm
length 13cm