

factor. (1)

(1) $x^2 - 4x - 32$ (2) $x^2 - 8x - 48$

$(x+4)(x-8)$ $\frac{32}{1 \cdot 32}$ $(x+4)(x-12)$ $\frac{48}{1 \cdot 48}$

$(x-8)(x+4)$ $\frac{2 \cdot 16}{4 \cdot 8}$ $\frac{2 \cdot 24}{3 \cdot 16}$

$\frac{44 \cdot 12}{6 \cdot 8}$

(3) $x^2 + 7x + 10$ (4) $x^2 - 4$ squares

$(x+2)(x+5)$ $\frac{10}{1 \cdot 10}$ $(x-2)(x+2)$ $\frac{4}{1 \cdot 4}$

$\frac{2 \cdot 5}{2 \cdot 2}$

(5) $x^2 + 10x - 48$ $\frac{48}{1 \cdot 48}$

$(x \quad)(x \quad)$ $\frac{2 \cdot 24}{3 \cdot 16}$

NO way $\frac{4 \cdot 12}{6 \cdot 8}$

to factor

Prime

$x^2 + 10x - 48$

(6) $4x^2 - 16$

$4(x^2 - 4)$

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

(7) $3x^2 - 75$

$3(x^2 - 25)$

$3(x-5)(x+5)$

(8) $\frac{4-x}{4-x} = 1$ (9) $\frac{4-x}{x-4} = -1$

$\frac{-1(x-4)}{-1(-4+x)} = -1$

$\frac{4-x}{x-4} = -1$

take $-1(x-4)$ they are opposites

$-x+4$

$4-x$

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Section 9.1

Simplify.

$\frac{8x^3 + 4x^2}{x^2 - 3x + 2} \cdot \frac{x^2 - 4}{16x^2 + 8x}$

not done

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

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

$4x^2(2x+1)$

$\frac{4x^2(2x+1)}{(x-1)(x-2)} \cdot \frac{(x+2)(x-2)}{8x(2x+1)}$

$\frac{1 \cdot 2 \cdot 4x^2(x+2)}{(x-1) \cdot \frac{8x}{4}} \cdot \frac{x(x+2)}{2(x-1)}$

0.3 6DD look for difference - subtract

$$15x^2 + 11x - 12$$

$$(5x - 3)(3x + 4)$$

$$\begin{array}{r} 15 \\ 1.15 \\ 3.5 \end{array}$$

$$\begin{array}{r} 12 \\ 1.12 \\ 2.6 \\ 3.4 \end{array}$$

$$15(12) = 180$$

$$\begin{array}{r} 1.180 \\ 2.90 \\ 3.60 \\ 4.45 \\ 5.36 \\ 6.30 \end{array}$$

$$\begin{array}{r} 1 \\ 15 \\ 3 \\ 5 \end{array}$$

$$\begin{array}{r} 1 \\ 12 \\ 2 \\ 6 \\ 3 \\ +4 \end{array}$$

$$\begin{array}{r} -9 + 20 \\ 10.18 \\ 12.15 \end{array}$$

$$(5x - 3)(3x + 4)$$

$$3x^2 + 7x - 20$$

$$(x + 4)(3x - 5)$$

$$\begin{array}{r} 20 \\ 1.20 \\ 2.10 \\ 4.5 \end{array}$$

$$60$$

$$\begin{array}{r} 1.60 \\ 2.30 \\ 3.20 \\ 4.15 \\ -5 + 12 \\ 6.10 \end{array}$$

$$\begin{array}{r} 1 \\ 3 \\ 20 \\ 2 \\ 10 \\ +4 \\ -5 \end{array}$$

$$(x + 4)(3x - 5)$$

p442#42

$$(42) \frac{x^5 y^3 y}{x^2 + 13x + 30} \cdot \frac{(x-1)(x+3)^{-1} \cdot 3}{x^2 + 2x - 3}$$

30
1.30
2.15
+3.70
5.6

$$\frac{y(x-1)}{x^2(x+10)}$$

$$(46) \frac{(x-1)(x-7)}{x^2 - 8x + 7} \cdot \frac{(x+5)(x-2)}{x^2 + 3x - 10}$$

$$\frac{x^2 + 3x - 4}{(x-1)(x+4)} \cdot \frac{x^2 - 9x + 14}{(x-2)(x-7)}$$

$$\frac{x+5}{x+4}$$

$$(50) \frac{(5-n)(5+n)^{-1}}{25-n^2} \cdot \frac{(n-10)(n+2)}{n^2-8n-20}$$

$$\frac{n^2-2n-35}{(n+5)(n-7)} \cdot \frac{n^2-3n-10}{(n+2)(n-5)}$$

$$\frac{5-n}{5-n} = 1$$

$$\frac{5-n}{n-5} = -1$$

$$\frac{-1(n-10)}{n-7} = \frac{10-n}{n-7}$$

$$-\frac{n-10}{n-7}$$

Factoring Trinomials when The Leading Coefficient Is Not One

- 1st: Set up the answer.
 - 2nd: List all factor pairs of the last term.
 - 3rd: List all factor pairs of the first term.
 - 4th: List all factor pairs of the product of the first and the last terms.
 - 5th: Add or subtract to get the middle term.
 - If +, add and make both the same sign.
 - If -, subtract and make the signs different.
 - 6th: The "larger" number always takes this (linear term) sign.
 - 7th: Match a pair of factors of the first with a pair of factors of the last to make the required factors of the product.
 - 8th: Place factor by matching OUTERS with OUTERS and INNERS with INNERS.
 - 9th: Verify by multiplying to obtain the product.
- from www.mathnstuff.com/math/algebra/afactor.htm

Factor $\frac{3}{13}$

$$3x^2 + 17x + 10$$

$(1x + 5)(3x + 2)$

$3 \times 10 = 30$
 $\frac{10}{1 \cdot 10}$
 $\frac{2 \cdot 5}{2 \cdot 5}$

$\frac{1 \cdot 30}{1 \cdot 30}$
 $\frac{+2 \cdot 15}{+2 \cdot 15}$

$\frac{3 \cdot 10}{3 \cdot 10}$
 $\frac{5 \cdot 6}{5 \cdot 6}$

1
 3

$\frac{10}{+2}$
 $\frac{+5}{+5}$

Factor

$$3x^2 - 22x - 16$$

$(1x - 8)(3x + 2)$

$3 \times 16 = 48$
 $\frac{16}{1 \cdot 16}$
 $\frac{2 \cdot 24}{2 \cdot 24}$

$\frac{1 \cdot 48}{1 \cdot 48}$
 $\frac{+2 \cdot 24}{+2 \cdot 24}$

$\frac{3 \cdot 16}{3 \cdot 16}$
 $\frac{4 \cdot 12}{4 \cdot 12}$
 $\frac{6 \cdot 8}{6 \cdot 8}$

1
 3

$\frac{16}{+2}$
 $\frac{-8}{-8}$

4
 4

(56)

$$\begin{array}{r} 32 \\ 1 \cdot 32 \\ 2 \cdot 16 \\ 4 \cdot 8 \end{array}$$

$$\begin{array}{r} 48 \\ 1 \cdot 48 \\ 2 \cdot 24 \\ 3 \cdot 16 \\ 4 \cdot 12 \\ 6 \cdot 8 \end{array}$$

$$\frac{x^2 - 4x - 32}{x^2 - 8x - 48} = \frac{(x+4)(x-12)}{(x+4)(x-12)}$$

$$\frac{3x^2 + 17x + 10}{3x^2 - 22x - 16} = \frac{(x+5)(3x+2)}{(x-8)(3x+2)}$$

$$\frac{x+5}{x-12}$$

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$$\begin{array}{r} 8 \\ 1 \cdot 8 \\ 2 \cdot 4 \end{array}$$

$$8z^2 - 36z + 1 = (z \quad)(z \quad)$$

1 prime
8 not factorable!
2
4

$$\begin{array}{r} 8 \\ 1 \cdot 8 \\ 2 \cdot 4 \end{array}$$

NO WAY
to get 36

$$8z^2 - 36z + 1$$

odds #3-21

51, Take out a
55 Common
57 monomial!
61

$$9x^2 + 33x - 60$$

$$3(3x^2 + 11x - 20)$$

$$3(1x + 5)(3x - 4)$$

$$3(20) = 60$$

$$1 \cdot 60$$

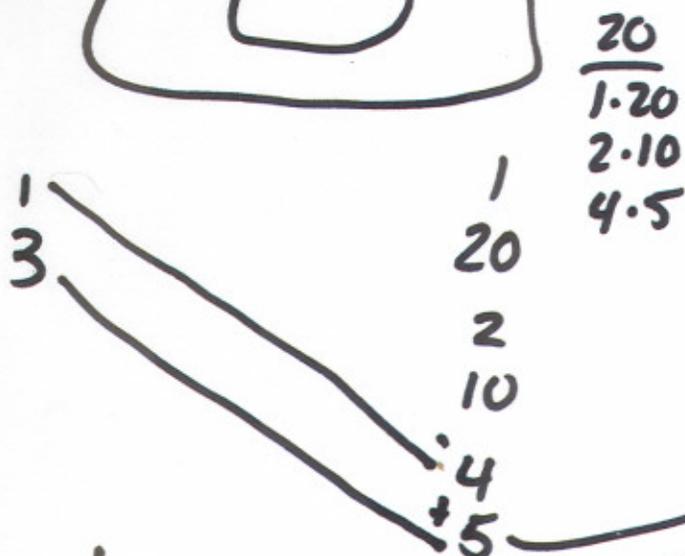
$$2 \cdot 30$$

$$3 \cdot 20$$

$$-4 \cdot -15$$

$$5 \cdot 12$$

$$6 \cdot 10$$



Factor

pg 401
ex 4

$$3x^3 - 23x^2 + 14x$$

$$x(3x^2 - 23x + 14)$$

$$x(3x - 2)(1x - 7)$$

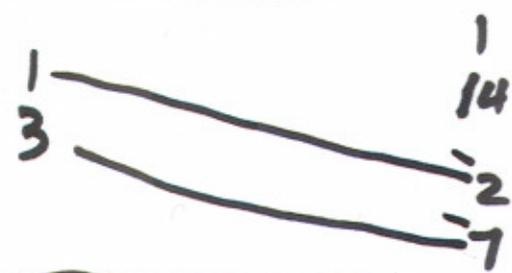
$$3(14) = 42$$

$$1 \cdot 42$$

$$-2 \cdot -21$$

$$3 \cdot 14$$

$$6 \cdot 7$$



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

1st Look for common monomials

ex. $3x^2 + 6x$

$3x(x+2)$

ex. $25x^2 - 100$

$25(x^2 - 4)$
 $25(x-2)(x+2)$

ex.

$5x^2 + 10x + 5$

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

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

ex. $25x^2 + 100$

$25(x^2 + 4)$

2nd Look for special products

$x^2 + y^2$

sum of two squares.

can't be factored over the reals

$x^2 - y^2$

difference of two squares

$(x-y)(x+y)$

$x^2 + 2xy + y^2$

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

perfect square trinomials

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

$(x+y)(x+y)$ $(x-y)(x-y)$

$(x+y)^2$

$(x-y)^2$

3rd Look for regular trinomials

4th Look for long (coefficient of x^2 term is not 1) trinomials.

$$\textcircled{1} x^2 - 16 \quad (x-4)(x+4)$$

$$\textcircled{2} x^2 - 36 \quad (x-6)(x+6)$$

$$\textcircled{3} x^2 + 25 \quad x^2 + 25$$

$$\textcircled{4} x^2 + 6x + 9 \quad (x+3)(x+3) \text{ or } (x+3)^2$$

$$\textcircled{5} 12x^2 - 12 \quad 12(x^2 - 1) \rightarrow 12(x+1)(x-1)$$

$$\textcircled{6} 10x^2 - 5x - 50 \quad 5(2x^2 - x - 10) \quad 2(10) = 20$$

$$\textcircled{7} x^2 + 7x + 10$$

$$(x+2)(x+5)$$

$$(x+5)^2$$

$$(x+5)(x+5)$$

$$x^2 + 10x + 25$$

$$5(1x \quad) \quad (2x \quad)$$

~~$$5(1x \quad) \quad (2x \quad)$$~~

~~$$5(1x \quad) \quad (2x \quad)$$~~

$$5(2x^2 - x - 10)$$
$$5(1x + 2)(2x - 5)$$

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