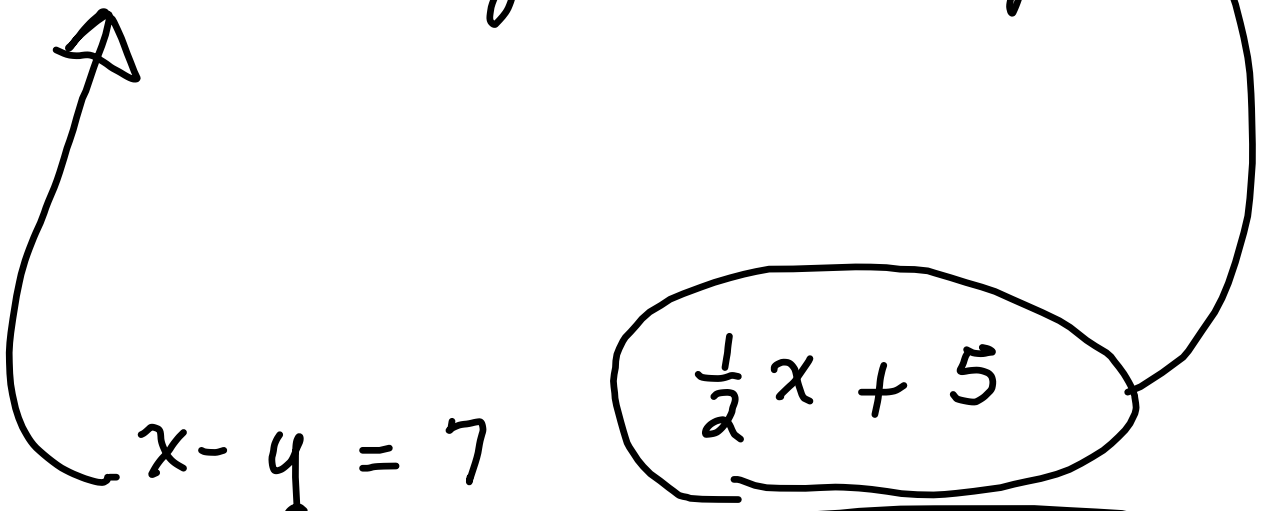
⑭ An expression ←

② a line with a positive slope



$$-y = -x + 7$$

$$y = x - 7$$

(22)

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$$\frac{15x^2 + 19x - 4}{3x + 8}$$

$$5x - 7 + \frac{52}{3x+8}$$

$$(3x+8)\overline{)\,15x^2 + 19x - 4}$$

$$-(15x^2 + 40x)$$

$$-21x - 4$$

$$\pm 21x \pm 56$$

$$52$$

(32) $\dfrac{x^3 + 27}{x + 3}$

$0 - (-9)$

$$
\begin{array}{r}
x^2 - 3x + 9 \\
\hline
x+3 \;\big)\; x^3 + 0x^2 + 0x + 27 \\
\underline{-x^3 + 3x^2} \\
-3x^2 + 0x \\
\underline{+3x^2 - 9x} \\
9x + 27 \\
\underline{-9x + 27} \\
0
\end{array}
$$

6.1 The Greatest Common Factor GCF

Ex $14x + 21$

$7(2x + 3)$

Ex $30xy^2 - 25x^2y$

$5xy(6y - 5x)$

Ex $20a^4b^3 - 18a^3b^4 + 22a^4b^4$

$2a^3b^3(10a - 9b + 11ab)$

(20) $15x^3 - 25x^2 + 30x$

pg 311 $5x(3x^2 - 5x + 6)$

Factoring By Grouping

$$\frac{ax - ay + bx - by}{a(x-y) + b(x-y)}$$

$ac + bc$ now let $c = x - y$

$c(a+b)$

$a(x-y) + b(x-y)$ $\quad \frac{a(x-y)}{(x-y)} = a$

$(x-y)(a+b)$

$(x-y)\left[\frac{a(x-y)}{(x-y)} + \frac{b(x-y)}{x-y}\right]$

$(x-y)[a+b]$

distributive property

$a(x-y)(a+b)$

$a(x-y) + b(x-y)$

$4x + 4y$

$4(x + y)$

what if 4 is $4+c$

made this up

$(4+c)x + (4+c)y$

$(4+c)(x+y)$

$ax + bx + ay + by$

$x(a+b) + y(a+b)$ ← contains $(a+b)$

contains $(a+b)$

$(a+b)(x+y)$

$\frac{x(a+b)}{(a+b)} = x$

ex $8x^3 - 12x^2 + 14x - 21$

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

$(2x-3)(4x^2+7)$ done

without square

$(4x+7)(2x-3)$

6.2 Factor trinomials -

where x^2 has a coefficient of 1.

$(x+3)(x+4) = x^2 + 4x + 3x + 12$

multiplying

factoring

$= x^2 + 7x + 12$

$(3+4)x$

$(x+a)(x+b) = x^2 + ax + bx + ab$

factoring

$x^2 + (a+b)x + ab$

multiplying

sum

product

Factor $1x^2 + 7x + 10$ prod 10 $2(5)$

ex $(x+2)(x+5)$ sum 7

(ex) $x^2 - 7x + 10$ prod 10 $(-2)(-5)$

sum -7

$(x-2)(x-5)$

(iv) $x^2 + 3x - 18$

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

prod -18

sum 3

$6(-3)$

$-6(3)$

the larger absolute value gets sign of sum.

(v) $y^2 + y - 42$

$(y-6)(y+7)$

prod -42 $-6(+7)$

sum 1

(ex) $3r^3 - 3r^2 - 6r$

1st thing check for GCF

$3r(r^2 - r - 2)$

now factor the trinomial

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

prod -2 $-2(1)$
sum -1

χ

(14) $x^2 - 5xy + 6y^2$

prod 6 $(-3)(-2)$
sum -5

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

$-5yx$