

The Quadratic Equations

Set 1

1 Find the two solutions for each equation. Check by substitution to ensure your answers are correct.

- a $x(x-5)=0$
 b $5a(a-2)=0$
 c $(x-2)(x-1)=0$
 d $(y+3)(y+4)=0$
 e $(a-6)(a+6)=0$
 f $(a+1)(2a-1)=0$
 g $(4x-1)(2x+1)=0$
 h $6x(5x-3)=0$
 i $x^2+3x=0$
 j $6x^2+12x=0$
 k $x^2-4=0$
 l $a^2-1=0$
 m $x^2+3x+2=0$
 n $a^2-10a+21=0$
 o $h^2+h-20=0$
 p $x^2+x-56=0$
 q $2x^2+x-1=0$
 r $3x^2+17x+10=0$
 s $2x^2-x-10=0$
 t $4x^2+21x+5=0$
 u $2x^2-21x+5=0$
 v $4x^2-21x+5=0$
 w $2x^2-13x-24=0$
 x $4x^2-4x-3=0$
 y $9x^2+9x+2=0$
 z $12x^2-7x+1=0$

2 After factorising the left-hand side of each equation, solve the following.

- a $x^2+3x=0$
 b $6x^2+12x=0$
 c $x^2-4=0$
 d $a^2-1=0$
 e $x^2+3x+2=0$
 f $a^2-10a+21=0$
 g $h^2+h-20=0$
 h $x^2+x-56=0$
 i $2x^2+x-1=0$
 j $3x^2+17x+10=0$
 k $2x^2-x-10=0$
 l $4x^2+21x+5=0$
 m $2x^2-21x+5=0$
 n $4x^2-4x-3=0$
 o $9x^2+9x+2=0$
 p $12x^2-7x+1=0$
 q $2x^2+x-1=0$
 r $3x^2+17x+10=0$
 s $2x^2-x-10=0$
 t $4x^2+21x+5=0$
 u $2x^2-21x+5=0$
 v $4x^2-4x-3=0$
 w $9x^2+9x+2=0$
 x $12x^2-7x+1=0$
 y $2x^2+x-1=0$
 z $3x^2+17x+10=0$

3 Factorise and solve the following.

- a $2x^2+x-1=0$
 b $3x^2+17x+10=0$
 c $2x^2-x-10=0$
 d $4x^2+21x+5=0$
 e $2x^2-21x+5=0$
 f $4x^2-4x-3=0$
 g $9x^2+9x+2=0$
 h $12x^2-7x+1=0$
 i $2x^2+x-1=0$
 j $3x^2+17x+10=0$
 k $2x^2-x-10=0$
 l $4x^2+21x+5=0$
 m $2x^2-21x+5=0$
 n $4x^2-4x-3=0$
 o $9x^2+9x+2=0$
 p $12x^2-7x+1=0$
 q $2x^2+x-1=0$
 r $3x^2+17x+10=0$
 s $2x^2-x-10=0$
 t $4x^2+21x+5=0$
 u $2x^2-21x+5=0$
 v $4x^2-4x-3=0$
 w $9x^2+9x+2=0$
 x $12x^2-7x+1=0$
 y $2x^2+x-1=0$
 z $3x^2+17x+10=0$

4 Gather all the terms to one side of each equation and then solve.

- a $x^2=3x$
 b $m^2=8m$
 c $x^2=-5x$
 d $x^2=5x-4$
 e $a^2=2a+15$
 f $y^2=3y-2$
 g $m^2=9m-18$
 h $n^2=7n+18$
 i $h^2=4h+32$
 j $x^2+x=2$
 k $y^2+2y=3$
 l $x^2-7x=-10$
 m $y^2+3y=18$
 n $t^2+3t=28$
 o $y^2+2y=15$
 p $2x^2+x=1$
 q $2x^2-x=15$
 r $4m^2-3m=6$
 s $3x^2=13x-14$
 t $5p^2=17p-6$
 u $2x^2=11x-5$
 v $2x^2=11x-5$
 w $2x^2=11x-5$
 x $2x^2=11x-5$
 y $2x^2=11x-5$
 z $2x^2=11x-5$

Set 2

1 What number must be inserted to complete the square?

- a $x^2+6x+\dots=(x+\dots)^2$
 b $x^2+8x+\dots=(x+\dots)^2$
 c $x^2-2x+\dots=(x-\dots)^2$
 d $x^2-4x+\dots=(x-\dots)^2$
 e $x^2+3x+\dots=(x+\dots)^2$
 f $x^2-7x+\dots=(x-\dots)^2$
 g $x^2+11x+\dots=(x+\dots)^2$
 h $x^2-x+\dots=(x-\dots)^2$
 i $x^2+\frac{5}{2}x+\dots=(x+\dots)^2$
 j $x^2-\frac{2}{3}x+\dots=(x-\dots)^2$
 k $x^2+2x+\dots=(x+\dots)^2$
 l $x^2-4x+\dots=(x-\dots)^2$
 m $x^2+6x+\dots=(x+\dots)^2$
 n $x^2-2x+\dots=(x-\dots)^2$
 o $x^2+8x+\dots=(x+\dots)^2$
 p $x^2-2x+\dots=(x-\dots)^2$
 q $x^2+3x+\dots=(x+\dots)^2$
 r $x^2-7x+\dots=(x-\dots)^2$
 s $x^2+11x+\dots=(x+\dots)^2$
 t $x^2-x+\dots=(x-\dots)^2$
 u $x^2+\frac{5}{2}x+\dots=(x+\dots)^2$
 v $x^2-\frac{2}{3}x+\dots=(x-\dots)^2$
 w $x^2+2x+\dots=(x+\dots)^2$
 x $x^2-4x+\dots=(x-\dots)^2$
 y $x^2+6x+\dots=(x+\dots)^2$
 z $x^2-2x+\dots=(x-\dots)^2$

2 Solve the following equations, leaving your answers in surd form.

- a $(x-2)^2=3$
 b $(x+1)^2=2$
 c $(x-3)^2=7$
 d $(x-1)^2=10$
 e $(x+3)^2=8$
 f $(x+10)^2=12$
 g $(x+\frac{1}{2})^2=5$
 h $(x-\frac{2}{3})^2=3$
 i $(x-1)^2=2\frac{1}{2}$
 j $(x+3)^2=4\frac{1}{2}$
 k $(x-2)^2=3$
 l $(x+1)^2=2$
 m $(x-3)^2=7$
 n $(x+10)^2=12$
 o $(x+\frac{1}{2})^2=5$
 p $(x-\frac{2}{3})^2=3$
 q $(x-1)^2=2\frac{1}{2}$
 r $(x+3)^2=4\frac{1}{2}$
 s $(x-2)^2=3$
 t $(x+1)^2=2$
 u $(x-3)^2=7$
 v $(x-1)^2=10$
 w $(x+3)^2=8$
 x $(x+10)^2=12$
 y $(x+\frac{1}{2})^2=5$
 z $(x-\frac{2}{3})^2=3$

3 Solve the following equations by completing the square. Also find approximations for your answers, correct to two decimal places.

- a $x^2+2x-1=0$
 b $x^2-2x-5=0$
 c $x^2-6x+2=0$
 d $x^2+6x-8=0$
 e $x^2-6x+2=0$
 f $x^2+2x=4$
 g $x^2+10x=5$
 h $x^2+7x-3=0$
 i $x^2+5x+3=0$
 j $x^2-9x+3=0$
 k $x^2+3x-5=0$
 l $x^2-11x+5=0$
 m $x^2-x=3$
 n $2x^2-4x-1=0$
 o $3x^2-4x-1=0$
 p $2x^2-4x-1=0$
 q $3x^2-4x-1=0$
 r $2x^2-4x-1=0$
 s $3x^2-4x-1=0$
 t $2x^2-4x-1=0$
 u $3x^2-4x-1=0$
 v $2x^2-4x-1=0$
 w $3x^2-4x-1=0$
 x $2x^2-4x-1=0$
 y $3x^2-4x-1=0$
 z $2x^2-4x-1=0$

Set 3

1 Use the quadratic formula to solve the following equations. All have rational answers.

- | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| a $x^2 + 5x + 6 = 0$ | b $x^2 + 6x + 8 = 0$ | c $x^2 + 10x + 9 = 0$ | d $x^2 - 3x - 10 = 0$ | e $x^2 - 2x - 15 = 0$ | f $x^2 + 4x - 12 = 0$ | g $x^2 - 9x + 14 = 0$ | h $x^2 - 8x + 12 = 0$ | i $3x^2 + 7x + 2 = 0$ | j $2x^2 + 11x + 5 = 0$ | k $2x^2 - 5x - 3 = 0$ | l $5x^2 - 9x - 2 = 0$ | m $6x^2 + 7x + 2 = 0$ | n $6x^2 + 7x - 3 = 0$ | o $8x^2 - 14x + 3 = 0$ | p $x^2 - 6x + 5 = 0$ | q $4x^2 + 11x + 6 = 0$ | r $4x^2 - 5x + 2 = 0$ | s $3x^2 - 5x - 2 = 0$ | t $8x^2 - 14x + 3 = 0$ | u $5x^2 - 9x - 2 = 0$ | v $3x^2 - 5x - 2 = 0$ | w $4x^2 - 3x - 2 = 0$ | x $5x^2 + 2x - 1 = 0$ | y $2x^2 - 9x + 8 = 0$ | z $2x^2 + 3x + 1 = 0$ | aa $x^2 + 2x - 2 = 0$ | ab $x^2 - 7x + 2 = 0$ | ac $x^2 - 8x + 3 = 0$ | ad $2x^2 + 3x - 1 = 0$ | ae $3x^2 - 9x + 2 = 0$ | af $3x^2 - 3x - 1 = 0$ | ag $4x^2 - 4x - 1 = 0$ | ah $5x^2 + 4x - 2 = 0$ | ai $4x^2 - 3x - 2 = 0$ | aj $5x^2 + 2x - 1 = 0$ | ak $6x^2 + 7x + 2 = 0$ | al $6x^2 + 7x - 3 = 0$ | am $7x^2 + 8x + 1 = 0$ | an $7x^2 + 8x - 1 = 0$ | ao $8x^2 + 9x + 1 = 0$ | ap $8x^2 + 9x - 1 = 0$ | aq $9x^2 + 10x + 1 = 0$ | ar $9x^2 + 10x - 1 = 0$ | as $10x^2 + 11x + 1 = 0$ | at $10x^2 + 11x - 1 = 0$ | au $11x^2 + 12x + 1 = 0$ | av $11x^2 + 12x - 1 = 0$ | aw $12x^2 + 13x + 1 = 0$ | ax $12x^2 + 13x - 1 = 0$ | ay $13x^2 + 14x + 1 = 0$ | az $13x^2 + 14x - 1 = 0$ | ba $14x^2 + 15x + 1 = 0$ | bb $14x^2 + 15x - 1 = 0$ | bc $15x^2 + 16x + 1 = 0$ | bd $15x^2 + 16x - 1 = 0$ | be $16x^2 + 17x + 1 = 0$ | bf $16x^2 + 17x - 1 = 0$ | bg $17x^2 + 18x + 1 = 0$ | bh $17x^2 + 18x - 1 = 0$ | bi $18x^2 + 19x + 1 = 0$ | bj $18x^2 + 19x - 1 = 0$ | bk $19x^2 + 20x + 1 = 0$ | bl $19x^2 + 20x - 1 = 0$ | bm $20x^2 + 21x + 1 = 0$ | bn $20x^2 + 21x - 1 = 0$ | bo $21x^2 + 22x + 1 = 0$ | bp $21x^2 + 22x - 1 = 0$ | bq $22x^2 + 23x + 1 = 0$ | br $22x^2 + 23x - 1 = 0$ | bs $23x^2 + 24x + 1 = 0$ | bt $23x^2 + 24x - 1 = 0$ | bu $24x^2 + 25x + 1 = 0$ | bv $24x^2 + 25x - 1 = 0$ | bw $25x^2 + 26x + 1 = 0$ | bx $25x^2 + 26x - 1 = 0$ | by $26x^2 + 27x + 1 = 0$ | bz $26x^2 + 27x - 1 = 0$ | ca $27x^2 + 28x + 1 = 0$ | cb $27x^2 + 28x - 1 = 0$ | cc $28x^2 + 29x + 1 = 0$ | cd $28x^2 + 29x - 1 = 0$ | ce $29x^2 + 30x + 1 = 0$ | cf $29x^2 + 30x - 1 = 0$ | cg $30x^2 + 31x + 1 = 0$ | ch $30x^2 + 31x - 1 = 0$ | ci $31x^2 + 32x + 1 = 0$ | cj $31x^2 + 32x - 1 = 0$ | ck $32x^2 + 33x + 1 = 0$ | cl $32x^2 + 33x - 1 = 0$ | cm $33x^2 + 34x + 1 = 0$ | cn $33x^2 + 34x - 1 = 0$ | co $34x^2 + 35x + 1 = 0$ | cp $34x^2 + 35x - 1 = 0$ | cq $35x^2 + 36x + 1 = 0$ | cr $35x^2 + 36x - 1 = 0$ | cs $36x^2 + 37x + 1 = 0$ | ct $36x^2 + 37x - 1 = 0$ | cu $37x^2 + 38x + 1 = 0$ | cv $37x^2 + 38x - 1 = 0$ | cw $38x^2 + 39x + 1 = 0$ | cx $38x^2 + 39x - 1 = 0$ | cy $39x^2 + 40x + 1 = 0$ | cz $39x^2 + 40x - 1 = 0$ | da $40x^2 + 41x + 1 = 0$ | db $40x^2 + 41x - 1 = 0$ | dc $41x^2 + 42x + 1 = 0$ | dd $41x^2 + 42x - 1 = 0$ | de $42x^2 + 43x + 1 = 0$ | df $42x^2 + 43x - 1 = 0$ | dg $43x^2 + 44x + 1 = 0$ | dh $43x^2 + 44x - 1 = 0$ | di $44x^2 + 45x + 1 = 0$ | dj $44x^2 + 45x - 1 = 0$ | dk $45x^2 + 46x + 1 = 0$ | dl $45x^2 + 46x - 1 = 0$ | dm $46x^2 + 47x + 1 = 0$ | dn $46x^2 + 47x - 1 = 0$ | do $47x^2 + 48x + 1 = 0$ | dp $47x^2 + 48x - 1 = 0$ | dq $48x^2 + 49x + 1 = 0$ | dr $48x^2 + 49x - 1 = 0$ | ds $49x^2 + 50x + 1 = 0$ | dt $49x^2 + 50x - 1 = 0$ | du $50x^2 + 51x + 1 = 0$ | dv $50x^2 + 51x - 1 = 0$ | dw $51x^2 + 52x + 1 = 0$ | dx $51x^2 + 52x - 1 = 0$ | dy $52x^2 + 53x + 1 = 0$ | dz $52x^2 + 53x - 1 = 0$ | ea $53x^2 + 54x + 1 = 0$ | eb $53x^2 + 54x - 1 = 0$ | ec $54x^2 + 55x + 1 = 0$ | ed $54x^2 + 55x - 1 = 0$ | ee $55x^2 + 56x + 1 = 0$ | ef $55x^2 + 56x - 1 = 0$ | eg $56x^2 + 57x + 1 = 0$ | eh $56x^2 + 57x - 1 = 0$ | ei $57x^2 + 58x + 1 = 0$ | ej $57x^2 + 58x - 1 = 0$ | ek $58x^2 + 59x + 1 = 0$ | el $58x^2 + 59x - 1 = 0$ | em $59x^2 + 60x + 1 = 0$ | en $59x^2 + 60x - 1 = 0$ | eo $60x^2 + 61x + 1 = 0$ | ep $60x^2 + 61x - 1 = 0$ | eq $61x^2 + 62x + 1 = 0$ | er $61x^2 + 62x - 1 = 0$ | es $62x^2 + 63x + 1 = 0$ | et $62x^2 + 63x - 1 = 0$ | eu $63x^2 + 64x + 1 = 0$ | ev $63x^2 + 64x - 1 = 0$ | ew $64x^2 + 65x + 1 = 0$ | ex $64x^2 + 65x - 1 = 0$ | ey $65x^2 + 66x + 1 = 0$ | ez $65x^2 + 66x - 1 = 0$ | fa $66x^2 + 67x + 1 = 0$ | fb $66x^2 + 67x - 1 = 0$ | fc $67x^2 + 68x + 1 = 0$ | fd $67x^2 + 68x - 1 = 0$ | fe $68x^2 + 69x + 1 = 0$ | ff $68x^2 + 69x - 1 = 0$ | fg $69x^2 + 70x + 1 = 0$ | fh $69x^2 + 70x - 1 = 0$ | fi $70x^2 + 71x + 1 = 0$ | fj $70x^2 + 71x - 1 = 0$ | fk $71x^2 + 72x + 1 = 0$ | fl $71x^2 + 72x - 1 = 0$ | fm $72x^2 + 73x + 1 = 0$ | fn $72x^2 + 73x - 1 = 0$ | fo $73x^2 + 74x + 1 = 0$ | fp $73x^2 + 74x - 1 = 0$ | fq $74x^2 + 75x + 1 = 0$ | fr $74x^2 + 75x - 1 = 0$ | fs $75x^2 + 76x + 1 = 0$ | ft $75x^2 + 76x - 1 = 0$ | fu $76x^2 + 77x + 1 = 0$ | fv $76x^2 + 77x - 1 = 0$ | fw $77x^2 + 78x + 1 = 0$ | fx $77x^2 + 78x - 1 = 0$ | fy $78x^2 + 79x + 1 = 0$ | fz $78x^2 + 79x - 1 = 0$ | ga $79x^2 + 80x + 1 = 0$ | gb $79x^2 + 80x - 1 = 0$ | gc $80x^2 + 81x + 1 = 0$ | gd $80x^2 + 81x - 1 = 0$ | ge $81x^2 + 82x + 1 = 0$ | gf $81x^2 + 82x - 1 = 0$ | gg $82x^2 + 83x + 1 = 0$ | gh $82x^2 + 83x - 1 = 0$ | gi $83x^2 + 84x + 1 = 0$ | gj $83x^2 + 84x - 1 = 0$ | gk $84x^2 + 85x + 1 = 0$ | gl $84x^2 + 85x - 1 = 0$ | gm $85x^2 + 86x + 1 = 0$ | gn $85x^2 + 86x - 1 = 0$ | go $86x^2 + 87x + 1 = 0$ | gp $86x^2 + 87x - 1 = 0$ | gq $87x^2 + 88x + 1 = 0$ | gr $87x^2 + 88x - 1 = 0$ | gs $88x^2 + 89x + 1 = 0$ | gt $88x^2 + 89x - 1 = 0$ | gu $89x^2 + 90x + 1 = 0$ | gv $89x^2 + 90x - 1 = 0$ | gw $90x^2 + 91x + 1 = 0$ | gx $90x^2 + 91x - 1 = 0$ | gy $91x^2 + 92x + 1 = 0$ | gz $91x^2 + 92x - 1 = 0$ | ha $92x^2 + 93x + 1 = 0$ | hb $92x^2 + 93x - 1 = 0$ | hc $93x^2 + 94x + 1 = 0$ | hd $93x^2 + 94x - 1 = 0$ | he $94x^2 + 95x + 1 = 0$ | hf $94x^2 + 95x - 1 = 0$ | hg $95x^2 + 96x + 1 = 0$ | hh $95x^2 + 96x - 1 = 0$ | hi $96x^2 + 97x + 1 = 0$ | hj $96x^2 + 97x - 1 = 0$ | hk $97x^2 + 98x + 1 = 0$ | hl $97x^2 + 98x - 1 = 0$ | hm $98x^2 + 99x + 1 = 0$ | hn $98x^2 + 99x - 1 = 0$ | ho $99x^2 + 100x + 1 = 0$ | hp $99x^2 + 100x - 1 = 0$ | hq $100x^2 + 101x + 1 = 0$ | hr $100x^2 + 101x - 1 = 0$ | hs $101x^2 + 102x + 1 = 0$ | ht $101x^2 + 102x - 1 = 0$ | hu $102x^2 + 103x + 1 = 0$ | hv $102x^2 + 103x - 1 = 0$ | hw $103x^2 + 104x + 1 = 0$ | hx $103x^2 + 104x - 1 = 0$ | hy $104x^2 + 105x + 1 = 0$ | hz $104x^2 + 105x - 1 = 0$ | ia $105x^2 + 106x + 1 = 0$ | ib $105x^2 + 106x - 1 = 0$ | ic $106x^2 + 107x + 1 = 0$ | id $106x^2 + 107x - 1 = 0$ | ie $107x^2 + 108x + 1 = 0$ | if $107x^2 + 108x - 1 = 0$ | ig $108x^2 + 109x + 1 = 0$ | ih $108x^2 + 109x - 1 = 0$ | ii $109x^2 + 110x + 1 = 0$ | ij $109x^2 + 110x - 1 = 0$ | ik $110x^2 + 111x + 1 = 0$ | il $110x^2 + 111x - 1 = 0$ | im $111x^2 + 112x + 1 = 0$ | in $111x^2 + 112x - 1 = 0$ | io $112x^2 + 113x + 1 = 0$ | ip $112x^2 + 113x - 1 = 0$ | iq $113x^2 + 114x + 1 = 0$ | ir $113x^2 + 114x - 1 = 0$ | is $114x^2 + 115x + 1 = 0$ | it $114x^2 + 115x - 1 = 0$ | iu $115x^2 + 116x + 1 = 0$ | iv $115x^2 + 116x - 1 = 0$ | iw $116x^2 + 117x + 1 = 0$ | ix $116x^2 + 117x - 1 = 0$ | iy $117x^2 + 118x + 1 = 0$ | iz $117x^2 + 118x - 1 = 0$ | ja $118x^2 + 119x + 1 = 0$ | jb $118x^2 + 119x - 1 = 0$ | jc $119x^2 + 120x + 1 = 0$ | jd $119x^2 + 120x - 1 = 0$ | je $120x^2 + 121x + 1 = 0$ | jf $120x^2 + 121x - 1 = 0$ | jj $121x^2 + 122x + 1 = 0$ | jk $121x^2 + 122x - 1 = 0$ | jl $122x^2 + 123x + 1 = 0$ | jm $122x^2 + 123x - 1 = 0$ | jn $123x^2 + 124x + 1 = 0$ | jo $123x^2 + 124x - 1 = 0$ | jp $124x^2 + 125x + 1 = 0$ | jq $124x^2 + 125x - 1 = 0$ | jr $125x^2 + 126x + 1 = 0$ | js $125x^2 + 126x - 1 = 0$ | jt $126x^2 + 127x + 1 = 0$ | ju $126x^2 + 127x - 1 = 0$ | jv $127x^2 + 128x + 1 = 0$ | jw $127x^2 + 128x - 1 = 0$ | ju $128x^2 + 129x + 1 = 0$ | jx $128x^2 + 129x - 1 = 0$ | jy $129x^2 + 130x + 1 = 0$ | jz $129x^2 + 130x - 1 = 0$ | ka $130x^2 + 131x + 1 = 0$ | kb $130x^2 + 131x - 1 = 0$ | kc $131x^2 + 132x + 1 = 0$ | kd $131x^2 + 132x - 1 = 0$ | ke $132x^2 + 133x + 1 = 0$ | kf $132x^2 + 133x - 1 = 0$ | kg $133x^2 + 134x + 1 = 0$ | kh $133x^2 + 134x - 1 = 0$ | ki $134x^2 + 135x + 1 = 0$ | kl $134x^2 + 135x - 1 = 0$ | km $135x^2 + 136x + 1 = 0$ | kn $135x^2 + 136x - 1 = 0$ | ko $136x^2 + 137x + 1 = 0$ | kp $136x^2 + 137x - 1 = 0$ | kq $137x^2 + 138x + 1 = 0$ | kr $137x^2 + 138x - 1 = 0$ | ks $138x^2 + 139x + 1 = 0$ | kt $138x^2 + 139x - 1 = 0$ | ku $139x^2 + 140x + 1 = 0$ | kv $139x^2 + 140x - 1 = 0$ | kw $140x^2 + 141x + 1 = 0$ | kx $140x^2 + 141x - 1 = 0$ | ky $141x^2 + 142x + 1 = 0$ | kz $141x^2 + 142x - 1 = 0$ | la $142x^2 + 143x + 1 = 0$ | lb $142x^2 + 143x - 1 = 0$ | lc $143x^2 + 144x + 1 = 0$ | ld $143x^2 + 144x - 1 = 0$ | le $144x^2 + 145x + 1 = 0$ | lf $144x^2 + 145x - 1 = 0$ | lg $145x^2 + 146x + 1 = 0$ | lh $145x^2 + 146x - 1 = 0$ | li $146x^2 + 147x + 1 = 0$ | lj $146x^2 + 147x - 1 = 0$ | lk $147x^2 + 148x + 1 = 0$ | ll $147x^2 + 148x - 1 = 0$ | lm $148x^2 + 149x + 1 = 0$ | ln $148x^2 + 149x - 1 = 0$ | lo $149x^2 + 150x + 1 = 0$ | lp $149x^2 + 150x - 1 = 0$ | lq $150x^2 + 151x + 1 = 0$ | lr $150x^2 + 151x - 1 = 0$ | ls $151x^2 + 152x + 1 = 0$ | lt $151x^2 + 152x - 1 = 0$ | lu $152x^2 + 153x + 1 = 0$ | lv $152x^2 + 153x - 1 = 0$ | lw $153x^2 + 154x + 1 = 0$ | lx $153x^2 + 154x - 1 = 0$ | ly $154x^2 + 155x + 1 = 0$ | lz $154x^2 + 155x - 1 = 0$ | ma $155x^2 + 156x + 1 = 0$ | mb $155x^2 + 156x - 1 = 0$ | mc $156x^2 + 157x + 1 = 0$ | md $156x^2 + 157x - 1 = 0$ | me $157x^2 + 158x + 1 = 0$ | mf $157x^2 + 158x - 1 = 0$ | mg $158x^2 + 159x + 1 = 0$ | mh $158x^2 + 159x - 1 = 0$ | mi $159x^2 + 160x + 1 = 0$ | mj $159x^2 + 160x - 1 = 0$ | mk $160x^2 + 161x + 1 = 0$ | ml $160x^2 + 161x - 1 = 0$ | mn $161x^2 + 162x + 1 = 0$ | mo $161x^2 + 162x - 1 = 0$ | mp $162x^2 + 163x + 1 = 0$ | mq $162x^2 + 163x - 1 = 0$ | mr $163x^2 + 164x + 1 = 0$ | ms $163x^2 + 164x - 1 = 0$ | mt $164x^2 + 165x + 1 = 0$ | mu $164x^2 + 165x - 1 = 0$ | mv $165x^2 + 166x + 1 = 0$ | mw $165x^2 + 166x - 1 = 0$ | mx $166x^2 + 167x + 1 = 0$ | my $166x^2 + 167x - 1 = 0$ | mz $167x^2 + 168x + 1 = 0$ | na $167x^2 + 168x - 1 = 0$ | nb $168x^2 + 169x + 1 = 0$ | nc $168x^2 + 169x - 1 = 0$ | nd $169x^2 + 170x + 1 = 0$ | ne $169x^2 + 170x - 1 = 0$ | nf $170x^2 + 171x + 1 = 0$ | ng $170x^2 + 171x - 1 = 0$ | ni $171x^2 + 172x + 1 = 0$ | nj $171x^2 + 172x - 1 = 0$ | nk $172x^2 + 173x + 1 = 0$ | nl $172x^2 + 173x - 1 = 0$ | nm $173x^2 + 174x + 1 = 0$ | no $173x^2 + 174x - 1 = 0$ | np $174x^2 + 175x + 1 = 0$ | nq $174x^2 + 175x - 1 = 0$ | nr $175x^2 + 176x + 1 = 0$ | ns $175x^2 + 176x - 1 = 0$ | nt $176x^2 + 177x + 1 = 0$ | nu $176x^2 + 177x - 1 = 0$ | nv $177x^2 + 178x + 1 = 0$ | nw $177x^2 + 178x - 1 = 0$ | nx $178x^2 + 179x + 1 = 0$ | ny $178x^2 + 179x - 1 = 0$ | nz $179x^2 + 180x + 1 = 0$ | oa $179x^2 + 180x - 1 = 0$ | ob $180x^2 + 181x + 1 = 0$ | oc $180x^2 + 181x - 1 = 0$ | od $181x^2 + 182x + 1 = 0$ | oe $181x^2 + 182x - 1 = 0$ | of $182x^2 + 183x + 1 = 0$ | og $182x^2 + 183x - 1 = 0$ | oh $183x^2 + 184x + 1 = 0$ | oi $183x^2 + 184x - 1 = 0$ | oj $184x^2 + 185x + 1 = 0$ | ok $184x^2 + 185x - 1 = 0$ | ol $185x^2 + 186x + 1 = 0$ | om $185x^2 + 186x - 1 = 0$ | on $186x^2 + 187x + 1 = 0$ | oo $186x^2 + 187x - 1 = 0$ | op $187x^2 + 188x + 1 = 0$ | oq $187x^2 + 188x - 1 = 0$ | or $188x^2 + 189x + 1 = 0$ | os $188x^2 + 189x - 1 = 0$ | ot $189x^2 + 190x + 1 = 0$ | ou $189x^2 + 190x - 1 = 0$ | ov $190x^2 + 191x + 1 = 0$ | ow $190x^2 + 191x - 1 = 0$ | ox $191x^2 + 192x + 1 = 0$ | oy $191x^2 + 192x - 1 = 0$ | oz $192x^2 + 193x + 1 = 0$ | pa $192x^2 + 193x - 1 = 0$ | pb $193x^2 + 194x + 1 = 0$ | pc $193x^2 + 194x - 1 = 0$ | pd $194x^2 + 195x + 1 = 0$ | pe $194x^2 + 195x - 1 = 0$ | pf $195x^2 + 196x + 1 = 0$ | pg $195x^2 + 196x - 1 = 0$ | ph $196x^2 + 197x + 1 = 0$ | pi $196x^2 + 197x - 1 = 0$ | pj $197x^2 + 198x + 1 = 0$ | pk $197x^2 + 198x - 1 = 0$ | pl $198x^2 + 199x + 1 = 0$ | pm $198x^2 + 199x - 1 = 0$ | pn $199x^2 + 200x + 1 = 0$ | po $199x^2 + 200x - 1 = 0$ | pp $200x^2 + 201x + 1 = 0$ | pq $200x^2 + 201x - 1 = 0$ | pr $201x^2 + 202x + 1 = 0$ | ps $201x$ |
|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|----------------------|------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------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