［１］MyTwokansu3.java

```
/*
-----------------------------------------------------------------
            ２次関数のグラフの広がり
             Android 4.4（Kit Kat）
       Copyright(C) K.Niwa 2019.12.12
-----------------------------------------------------------------
*/

package jp.kiyo.wuena.mytwokansu3;

import android.content.Context;
import android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.graphics.Rect;
import android.graphics.RectF;
import android.util.AttributeSet;
import android.view.MotionEvent;
import android.view.View;

public class MyTwokansu3 extends View {

    int flag=0;     //グラフの移動(1)、グラフの停止(2)、グラフの初期化(0)初期化　識別子
    double x,y;    //グラフ描写に利用
    int px,py,oldpx,oldpy;   //グラフ描写に利用
    int fg;          //グラフ描写に利用
    double a=0,b=0;          //グラフ描写に利用

    public MyTwokansu3(Context context) {
        super(context);
    }

    public MyTwokansu3(Context context, AttributeSet attrs) {
        super(context,attrs);
    }

    public MyTwokansu3(Context context, AttributeSet attrs,int defStyle) {
        super(context,attrs,defStyle);
```

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    }

    //onDraw メソッド----------------------------------------------------------------------------
    @Override
    protected void onDraw(Canvas canvas) {

        super.onDraw(canvas);
        canvas.drawColor(Color.WHITE);
        Paint paint = new Paint();
        paint.setColor(Color.BLUE);
        paint.setAlpha(50);
        canvas.drawRect((getWidth()/2-240)+10,(getHeight()/2-343)+10,(getWidth()/2-240)
+470,(getHeight()/2-343)+675,paint);
        paint.setAlpha(10000);
        paint.setColor(Color.BLUE);

        for(int i=0;i<2;i++) {        //額縁を付ける
            canvas.drawLine((getWidth()/2-240)+10+i,(getHeight()/2-343)+10+i,(getWidth
()/2-240)+10+i,(getHeight()/2-343)+675-i,paint);
            canvas.drawLine((getWidth()/2-240)+10+i,(getHeight()/2-343)+675-i,(getWidth
()/2-240)+470-i,(getHeight()/2-343)+675-i,paint);
            canvas.drawLine((getWidth()/2-240)+470-i,(getHeight()/2-343)+675-i,(getWidth
()/2-240)+470-i,(getHeight()/2-343)+10+i,paint);
            canvas.drawLine((getWidth()/2-240)+470-i,(getHeight()/2-343)+10+i,(getWidth
()/2-240)+10+i,(getHeight()/2-343)+10+i,paint);
        }

        paint.setColor(Color.BLACK);          //実験枠の描画
          canvas.drawRect((getWidth()/2-240)+90,  (getHeight()/2-343)+100,(getWidth()
/2-240)+390,(getHeight()/2-343)+400,paint);
        paint.setColor(Color.WHITE);
          canvas.drawRect((getWidth()/2-240)+91,  (getHeight()/2-343)+101,(getWidth()
/2-240)+389,(getHeight()/2-343)+399,paint);

        paint.setColor(Color.BLACK);          //座標軸の描画
          canvas.drawLine((getWidth()/2-240)+100,  (getHeight()/2-343)+250,(getWidth()
/2-240)+380,(getHeight()/2-343)+250,paint);
          canvas.drawLine((getWidth()/2-240)+380,  (getHeight()/2-343)+250,(getWidth()
/2-240)+380-5,(getHeight()/2-343)+250-5,paint);
          canvas.drawLine((getWidth()/2-240)+380,  (getHeight()/2-343)+250,(getWidth()
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/2-240)+380-5,(getHeight()/2-343)+250+5,paint);
            canvas.drawLine((getWidth()/2-240)+240,  (getHeight()/2-343)+110,(getWidth()
/2-240)+240,(getHeight()/2-343)+390,paint);
            canvas.drawLine((getWidth()/2-240)+240,  (getHeight()/2-343)+110,(getWidth()
/2-240)+240+5,(getHeight()/2-343)+110+5,paint);
            canvas.drawLine((getWidth()/2-240)+240,  (getHeight()/2-343)+110,(getWidth()
/2-240)+240-5,(getHeight()/2-343)+110+5,paint);

        for（int xx=120;xx<=360;xx=xx+30）{          //x 軸メモリの描写
            canvas.drawLine((getWidth()/2-240)+xx,  (getHeight()/2-343)+250-3,(getWidth
()/2-240)+xx,(getHeight()/2-343)+250+3,paint);
        }
        for（int yy=130;yy<=370;yy=yy+20）{          //y 軸メモリの描写
            canvas.drawLine((getWidth()/2-240)+240-3,  (getHeight()/2-343)+yy,(getWidth
()/2-240)+240+3,(getHeight()/2-343)+yy,paint);
        }

        //x 軸メモリの描写
        canvas.drawText("1",（getWidth()/2-240)+270-3,（getHeight()/2-343)+260+5, paint);
        canvas.drawText("2",（getWidth()/2-240)+300-3,（getHeight()/2-343)+260+5, paint);
        canvas.drawText("3",（getWidth()/2-240)+330-3,（getHeight()/2-343)+260+5, paint);
        canvas.drawText("4",（getWidth()/2-240)+360-3,（getHeight()/2-343)+260+5, paint);
        canvas.drawText(" x ",（getWidth()/2-240)+375,（getHeight()/2-343)+260+5, paint);
        canvas.drawText("O",（getWidth()/2-240)+230-3,（getHeight()/2-343)+260+2, paint);
        canvas.drawText("-1",（getWidth()/2-240)+210-6,（getHeight()/2-343)+260+5, paint)
;
        canvas.drawText("-2",（getWidth()/2-240)+180-6,（getHeight()/2-343)+260+5, paint)
;
        canvas.drawText("-3",（getWidth()/2-240)+150-6,（getHeight()/2-343)+260+5, paint)
;
        canvas.drawText("-4",（getWidth()/2-240)+120-6,（getHeight()/2-343)+260+5, paint)
;

        //y 軸メモリの描写
        canvas.drawText("60",（getWidth()/2-240)+220,（getHeight()/2-343)+130+5, paint);
        canvas.drawText("50",（getWidth()/2-240)+220,（getHeight()/2-343)+150+5, paint);
        canvas.drawText("40",（getWidth()/2-240)+220,（getHeight()/2-343)+170+5, paint);
        canvas.drawText("30",（getWidth()/2-240)+220,（getHeight()/2-343)+190+5, paint);
        canvas.drawText("20",（getWidth()/2-240)+220,（getHeight()/2-343)+210+5, paint);
        canvas.drawText("10",（getWidth()/2-240)+220,（getHeight()/2-343)+230+5, paint);
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            canvas.drawText(" y ", (getWidth()/2-240)+220, (getHeight()/2-343)+110+5, paint);
              canvas.drawText("-10", (getWidth()/2-240)+220-5, (getHeight()/2-343)+270+5,
paint);
              canvas.drawText("-20", (getWidth()/2-240)+220-5, (getHeight()/2-343)+290+5,
paint);
              canvas.drawText("-30", (getWidth()/2-240)+220-5, (getHeight()/2-343)+310+5,
paint);
              canvas.drawText("-40", (getWidth()/2-240)+220-5, (getHeight()/2-343)+330+5,
paint);
              canvas.drawText("-50", (getWidth()/2-240)+220-5, (getHeight()/2-343)+350+5,
paint);
              canvas.drawText("-60", (getWidth()/2-240)+220-5, (getHeight()/2-343)+370+5,
paint);

            paint.setColor(Color.BLACK);          //実験枠の描画
              canvas.drawLine((getWidth()/2-240)+90, (getHeight()/2-343)+100,(getWidth()
/2-240)+90,(getHeight()/2-343)+400,paint);
              canvas.drawLine((getWidth()/2-240)+90, (getHeight()/2-343)+100,(getWidth()
/2-240)+390,(getHeight()/2-343)+100,paint);

            paint.setColor(Color.BLUE);//表題の表示
            paint.setTextSize(25.0f);
            canvas.drawText("", (getWidth()/2-240)+60, (getHeight()/2-343)+65, paint);
            canvas.drawText("【２次関数のグラフの広がり】", (getWidth()/2-240)+60+30-24,
(getHeight()/2-343)+65, paint);
            //canvas.drawText("2", (getWidth()/2-240)+170, (getHeight()/2-343)+50, paint);

            paint.setColor(Color.BLUE);//目標の提示
            paint.setTextSize(19.0f);
            canvas.drawText(" a ＞０のとき、 y ＝ a x^2 のｸﾞﾗﾌの広がりは、", (getWidth()
/2-240)+30+16, (getHeight()/2-343)+440, paint);
             //canvas.drawText("2", (getWidth()/2-240)+255-10, (getHeight()/2-343)+440-5-5,
paint);
             canvas.drawText(" a の値が大きくなるにつれて狭くなる。", (getWidth()/2-240)
+30, (getHeight()/2-343)+465, paint);
              canvas.drawText(" a ＜０のときは、 a の値が小さくなるにつれ", (getWidth()
/2-240)+30+18, (getHeight()/2-343)+490, paint);
             canvas.drawText("て狭くなる。これらのことを観察してみよう。", (getWidth()
/2-240)+30, (getHeight()/2-343)+515, paint);
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        paint.setColor(Color.BLACK);          //説明の表示
        paint.setTextSize(19.0f);
        canvas.drawText("※ 画面タッチで、ｙ＝ａｘ^2 のｸﾞﾗﾌを描きます。", (getWidth()/2-240)+50-20, (getHeight()/2-343)+550-5, paint);
        //canvas.drawText("2", (getWidth()/2-240)+290-60+13, (getHeight()/2-343)+545-5, paint);
        canvas.drawText("※ 画面をタッチするごとに順次ｸﾞﾗﾌを描きます。", (getWidth()/2-240)+50-20, (getHeight()/2-343)+575-5, paint);
        canvas.drawText("※ 6 回目と 12 回目のタッチで初期化されます。", (getWidth()/2-240)+50-20, (getHeight()/2-343)+600-5, paint);
        canvas.drawText("※ 画面が暗くなったらタイトルバーをタッチ！", (getWidth()/2-240)+50-20, (getHeight()/2-343)+625-5, paint);
        paint.setColor(Color.BLUE);
        paint.setTextSize(19.0f);
            canvas.drawText("Copyright(C) K.Niwa 2019.11", (getWidth()/2-240)+110, (getHeight()/2-343)+650, paint);          //作者・作成年月の表示

        paint.setTextSize(12.0f);

        if (flag==1) {
            //y=x^2 のグラフの描画
            paint.setColor(Color.BLUE);
              canvas.drawText("ｙ＝ｘ  ", (getWidth()/2-240)+300-20+50, (getHeight()/2-343)+230+10, paint);
                 canvas.drawText("2", (getWidth()/2-240)+315+50, (getHeight()/2-343)+230-5+10, paint);
            fg=0;
            for (x=-4.5;x<=4.6;x=x+0.1) {
                y=x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                      canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
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                fg++;
            }
        }

        else if（flag==2）｛
            //y=x^2 のグラフの描画
            paint.setColor（Color.BLUE）;
             canvas.drawText（"ｙ ＝ ｘ　 ", （getWidth（）/2-240）+330, （getHeight（）/2-343）
+240, paint）;
            canvas.drawText（"2", （getWidth（）/2-240）+365, （getHeight（）/2-343）+235, paint）;
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=x*x;
                px=（int）（240+30*x）;
                py=（int）（250-2*y）;
                if（fg==0）｛
                        canvas.drawLine（（int）（getWidth（）/2-240）+px, （int）（getHeight（）
/2-343）+py,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
                }
                else｛
                      canvas.drawLine（（int）（getWidth（）/2-240）+oldpx, （int）（getHeight（）
/2-343）+oldpy,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=2x^2 のグラフの描画
            paint.setColor（Color.RED）;
            canvas.drawText（"ｙ ＝ 2 ｘ　 ", （getWidth（）/2-240）+270, （getHeight（）/2-343）
+220, paint）;
            canvas.drawText（"2", （getWidth（）/2-240）+313, （getHeight（）/2-343）+215, paint）;
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=2*x*x;
                px=（int）（240+30*x）;
                py=（int）（250-2*y）;
                if（fg==0）｛
                        canvas.drawLine（（int）（getWidth（）/2-240）+px, （int）（getHeight（）
/2-343）+py,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
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                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

        }

        else if(flag==3) {
            //y=x^2 のグラフの描画
            paint.setColor(Color.BLUE);
             canvas.drawText("y = x  ", (getWidth()/2-240)+330, (getHeight()/2-343)
+240, paint);
            canvas.drawText("2",(getWidth()/2-240)+365,(getHeight()/2-343)+235, paint);
            fg=0;
            for(x=-4.5;x<=4.6;x=x+0.1) {
                y=x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if(fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=2x^2 のグラフの描画
            paint.setColor(Color.RED);
            canvas.drawText("y = 2 x  ", (getWidth()/2-240)+270, (getHeight()/2-343)
+220, paint);
            canvas.drawText("2",(getWidth()/2-240)+313,(getHeight()/2-343)+215, paint);
            fg=0;
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            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=2*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if（fg==0）｛
                        canvas.drawLine((int)（getWidth()/2-240)+px,　(int)（getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)（getHeight()/2-343)+py,paint);
                }
                else｛
                        canvas.drawLine((int)（getWidth()/2-240)+oldpx,　(int)（getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)（getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=3x^2 のグラフの描画
            paint.setColor(Color.BLACK);
            canvas.drawText("ｙ＝３ｘ　", (getWidth()/2-240)+280, (getHeight()/2-343)
+190, paint);
            canvas.drawText("2", (getWidth()/2-240)+323, (getHeight()/2-343)+185, paint);
            fg=0;
            for（x=-4.3;x<=4.4;x=x+0.1）｛
                y=3*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if（fg==0）｛
                        canvas.drawLine((int)（getWidth()/2-240)+px,　(int)（getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)（getHeight()/2-343)+py,paint);
                }
                else｛
                        canvas.drawLine((int)（getWidth()/2-240)+oldpx,　(int)（getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)（getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

        }
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        else if（flag==4）｛
            //y=x^2 のグラフの描画
            paint.setColor（Color.BLUE）;
             canvas.drawText（"ｙ ＝ ｘ　", （getWidth（）/2-240）+330, （getHeight（）/2-343）
+240, paint）;
            canvas.drawText（"2",（getWidth（）/2-240）+365,（getHeight（）/2-343）+235, paint）;
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=x*x;
                px=（int）（240+30*x）;
                py=（int）（250-2*y）;
                if（fg==0）｛
                        canvas.drawLine（（int）（getWidth（）/2-240）+px, （int）（getHeight（）
/2-343）+py,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
                }
                else｛
                      canvas.drawLine（（int）（getWidth（）/2-240）+oldpx, （int）（getHeight（）
/2-343）+oldpy,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=2x^2 のグラフの描画
            paint.setColor（Color.RED）;
            canvas.drawText（"ｙ ＝ 2 ｘ　", （getWidth（）/2-240）+270, （getHeight（）/2-343）
+220, paint）;
            canvas.drawText（"2",（getWidth（）/2-240）+313,（getHeight（）/2-343）+215, paint）;
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=2*x*x;
                px=（int）（240+30*x）;
                py=（int）（250-2*y）;
                if（fg==0）｛
                        canvas.drawLine（（int）（getWidth（）/2-240）+px, （int）（getHeight（）
/2-343）+py,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
                }
                else｛
                      canvas.drawLine（（int）（getWidth（）/2-240）+oldpx, （int）（getHeight（）
/2-343）+oldpy,（int）（getWidth（）/2-240）+px,（int）（getHeight（）/2-343）+py,paint）;
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                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=3x^2 のグラフの描画
            paint.setColor(Color.BLACK);
            canvas.drawText("ｙ＝３ｘ　", (getWidth()/2-240)+280, (getHeight()/2-343)
+190, paint);
            canvas.drawText("2", (getWidth()/2-240)+323, (getHeight()/2-343)+185, paint);
            fg=0;
            for (x=-4.3;x<=4.4;x=x+0.1) {
                y=3*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=4x^2 のグラフの描画
            paint.setColor(Color.MAGENTA);
            canvas.drawText("ｙ＝４ｘ　", (getWidth()/2-240)+280, (getHeight()/2-343)
+160, paint);
            canvas.drawText("2", (getWidth()/2-240)+323, (getHeight()/2-343)+155, paint);
            fg=0;
            for (x=-4.0;x<=4.1;x=x+0.1) {
                y=4*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
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                    }
                    else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }
            }

            else if(flag==5) {
                //y=x^2 のグラフの描画
                paint.setColor(Color.BLUE);
                 canvas.drawText("y = x  ", (getWidth()/2-240)+330, (getHeight()/2-343)
+240, paint);
                canvas.drawText("2",(getWidth()/2-240)+365,(getHeight()/2-343)+235, paint);
                fg=0;
                for(x=-4.5;x<=4.6;x=x+0.1) {
                    y=x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if(fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }

                //y=2x^2 のグラフの描画
                paint.setColor(Color.RED);
                canvas.drawText("y = 2 x  ", (getWidth()/2-240)+270, (getHeight()/2-343)
+220, paint);
                canvas.drawText("2",(getWidth()/2-240)+313,(getHeight()/2-343)+215, paint);
                fg=0;
                for(x=-4.5;x<=4.6;x=x+0.1) {
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                y=2*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if(fg==0){
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else{
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
        }

        //y=3x^2 のグラフの描画
        paint.setColor(Color.BLACK);
        canvas.drawText("y = 3 x  ", (getWidth()/2-240)+280, (getHeight()/2-343)
+190, paint);
        canvas.drawText("2", (getWidth()/2-240)+323, (getHeight()/2-343)+185, paint);
        fg=0;
        for(x=-4.3;x<=4.4;x=x+0.1){
                y=3*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if(fg==0){
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else{
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
        }

        //y=4x^2 のグラフの描画
        paint.setColor(Color.MAGENTA);
        canvas.drawText("y = 4 x  ", (getWidth()/2-240)+280, (getHeight()/2-343)
```

```
+160, paint);
                canvas.drawText("2", (getWidth()/2-240)+323, (getHeight()/2-343)+155, paint);
                fg=0;
                for (x=-4.0;x<=4.1;x=x+0.1) {
                    y=4*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }

                //y=5x^2 のグラフの描画
                paint.setColor(Color.CYAN);
                canvas.drawText("ｙ＝５ｘ　", (getWidth()/2-240)+290, (getHeight()/2-343)
+130, paint);
                canvas.drawText("2", (getWidth()/2-240)+333, (getHeight()/2-343)+125, paint);
                fg=0;
                for (x=-3.7;x<=3.8;x=x+0.1) {
                    y=5*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }
```

```
        }

        else if（flag==6）｛
        }


        if（flag==7）｛
            //y=-x^2 のグラフの描画
            paint.setColor(Color.BLUE);
             canvas.drawText("ｙ＝-ｘ　", （getWidth()/2-240)+280, （getHeight()/2-343）
+280, paint);
            canvas.drawText("2",（getWidth()/2-240)+320,（getHeight()/2-343)+275, paint);
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=-1*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if（fg==0）｛
                        canvas.drawLine((int)（getWidth()/2-240)+px, （int)（getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else ｛
                        canvas.drawLine((int)（getWidth()/2-240)+oldpx, （int)（getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }
        }

        else if（flag==8）｛
            //y=-x^2 のグラフの描画
            paint.setColor(Color.BLUE);
             canvas.drawText("ｙ＝-ｘ　", （getWidth()/2-240)+280, （getHeight()/2-343）
+280, paint);
            canvas.drawText("2",（getWidth()/2-240)+320,（getHeight()/2-343)+275, paint);
            fg=0;
            for（x=-4.5;x<=4.6;x=x+0.1）｛
                y=-1*x*x;
                px=(int)(240+30*x);
```

```
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-2x^2 のグラフの描画
            paint.setColor(Color.RED);
            canvas.drawText("y =-2 x ", (getWidth()/2-240)+285, (getHeight()/2-343)
+310, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+305, paint);
            fg=0;
            for (x=-4.5;x<=4.6;x=x+0.1) {
                y=-2*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

        }

        else if (flag==9) {
            //y=-x^2 のグラフの描画
            paint.setColor(Color.BLUE);
```

```
                canvas.drawText("ｙ＝-ｘ　", (getWidth()/2-240)+280, (getHeight()/2-343)
+280, paint);
                canvas.drawText("2", (getWidth()/2-240)+320, (getHeight()/2-343)+275, paint);
                fg=0;
                for (x=-4.5;x<=4.6;x=x+0.1) {
                    y=-1*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }

                //y=-2x^2 のグラフの描画
                paint.setColor(Color.RED);
                canvas.drawText("ｙ＝-2ｘ　", (getWidth()/2-240)+285, (getHeight()/2-343)
+310, paint);
                canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+305, paint);
                fg=0;
                for (x=-4.5;x<=4.6;x=x+0.1) {
                    y=-2*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
```

```
            }

            //y=-3x^2 のグラフの描画
            paint.setColor(Color.BLACK);
            canvas.drawText("ｙ＝-3 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+340, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+335, paint);
            fg=0;
            for (x=-4.3;x<=4.4;x=x+0.1) {
                y=-3*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

        }

        else if (flag==10) {
            //y=-x^2 のグラフの描画
            paint.setColor(Color.BLUE);
             canvas.drawText("ｙ＝- ｘ  ", (getWidth()/2-240)+280, (getHeight()/2-343)
+280, paint);
            canvas.drawText("2", (getWidth()/2-240)+320, (getHeight()/2-343)+275, paint);
            fg=0;
            for (x=-4.5;x<=4.6;x=x+0.1) {
                y=-1*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
```

```
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-2x^2 のグラフの描画
            paint.setColor(Color.RED);
            canvas.drawText("ｙ＝-2 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+310, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+305, paint);
            fg=0;
            for (x=-4.5;x<=4.6;x=x+0.1) {
                y=-2*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-3x^2 のグラフの描画
            paint.setColor(Color.BLACK);
            canvas.drawText("ｙ＝-3 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+340, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+335, paint);
            fg=0;
            for (x=-4.3;x<=4.4;x=x+0.1) {
                y=-3*x*x;
                px=(int)(240+30*x);
```

```
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-4x^2 のグラフの描画
            paint.setColor(Color.MAGENTA);
            canvas.drawText("y =-4 x ", (getWidth()/2-240)+285, (getHeight()/2-343)
+370, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+365, paint);
            fg=0;
            for (x=-4.0;x<=4.1;x=x+0.1) {
                y=-4*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }
        }

        else if (flag==11) {
            //y=-x^2 のグラフの描画
            paint.setColor(Color.BLUE);
             canvas.drawText("y =- x ", (getWidth()/2-240)+280, (getHeight()/2-343)
```

```
+280, paint);
                canvas.drawText("2", (getWidth()/2-240)+320, (getHeight()/2-343)+275, paint);
                fg=0;
                for (x=-4.5;x<=4.6;x=x+0.1) {
                    y=-1*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }

                //y=-2x^2 のグラフの描画
                paint.setColor(Color.RED);
                canvas.drawText("ｙ＝-2 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+310, paint);
                canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+305, paint);
                fg=0;
                for (x=-4.5;x<=4.6;x=x+0.1) {
                    y=-2*x*x;
                    px=(int)(240+30*x);
                    py=(int)(250-2*y);
                    if (fg==0) {
                            canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    else {
                            canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                    }
                    oldpx=px;oldpy=py;
                    fg++;
                }
```

```
            //y=-3x^2 のグラフの描画
            paint.setColor(Color.BLACK);
            canvas.drawText("ｙ＝-3 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+340, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+335, paint);
            fg=0;
            for (x=-4.3;x<=4.4;x=x+0.1) {
                y=-3*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-4x^2 のグラフの描画
            paint.setColor(Color.MAGENTA);
            canvas.drawText("ｙ＝-4 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+370, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+365, paint);
            fg=0;
            for (x=-4.0;x<=4.1;x=x+0.1) {
                y=-4*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
```

```
                }
                oldpx=px;oldpy=py;
                fg++;
            }

            //y=-5x^2 のグラフの描画
            paint.setColor(Color.CYAN);
            canvas.drawText("ｙ＝-5 ｘ  ", (getWidth()/2-240)+285, (getHeight()/2-343)
+390, paint);
            canvas.drawText("2", (getWidth()/2-240)+332, (getHeight()/2-343)+385, paint);
            fg=0;
            for (x=-3.7;x<=3.8;x=x+0.1) {
                y=-5*x*x;
                px=(int)(240+30*x);
                py=(int)(250-2*y);
                if (fg==0) {
                        canvas.drawLine((int)(getWidth()/2-240)+px, (int)(getHeight()
/2-343)+py,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                else {
                        canvas.drawLine((int)(getWidth()/2-240)+oldpx, (int)(getHeight()
/2-343)+oldpy,(int)(getWidth()/2-240)+px,(int)(getHeight()/2-343)+py,paint);
                }
                oldpx=px;oldpy=py;
                fg++;
            }
        }

        else if (flag==0) {
            //a=0;          //初期化する
            //b=0;          //初期化する
            //invalidate(); //再描画する（clear & goto onDraw）  そして、この行へ戻っ
てくる。
        }

    }//protected void onDraw(Canvas canvas)

        //画面にタッチしたときのイベント処理
---------------------------------------------------------------------------
    @Override
```

```
    public boolean onTouchEvent(MotionEvent event) {

        flag=flag+1;        //flag に１を加える
        flag=flag % 12;     //flag に１、２、・・・、１０、１１、０ を代入する

        invalidate();                                   //再描画する（clear & goto onDraw）
        return false;

    }
}
```

［２］activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
< a n d r o i d x . c o n s t r a i n t l a y o u t . w i d g e t . C o n s t r a i n t L a y o u t
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <jp.kiyo.wuena.mytwokansu3.MyTwokansu3
        android:id="@+id/myfview1"
        android:layout_height="match_parent"
        android:layout_width="match_parent"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

［３］MainActivity.java

```
/*
-----------------------------------------------------------------------
            ２次関数のグラフの広がり
             Android 4.4（Kit Kat）
        Copyright(C) K.Niwa 2019.12.12
-----------------------------------------------------------------------
*/

package jp.kiyo.wuena.mytwokansu3;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```