

Graphing Systems of Inequalities

Initialization Code (optional)

Manipulate

```

Manipulate[
dashing1 = Switch[ineq1, "<", 0.03, "≤", 0, "≥", 0, ">", 0.03];
Plot1 = Plot[m1 x + b1, {x, -13, 13}, Filling -> filling1, FillingStyle ->
  {{Blue, Opacity[0.5]}, {Blue, Opacity[0.5]}}, PlotStyle -> {Dashing -> dashing1, Blue}, PlotRange -> 13,
  PlotLabel -> Column[
  {
  Style[Row[{"y1 ", ineq1, If[m1 < 0, "", " "], ToString[NumberForm[m1, {3, 2}]] , " x1",
    If[b1 < 0, " - ", " + "], ToString[NumberForm[Abs[b1], {3, 2}]]}], {Blue, 18}],
  Style[Row[{"y2 ", ineq2, If[m2 < 0, "", " "], ToString[NumberForm[m2, {3, 2}]] , " x2",
    If[b2 < 0, " - ", " + "], ToString[NumberForm[Abs[b2], {3, 2}]]}], {Red, 18}],
  ]
  ];
dashing2 = Switch[ineq2, "<", 0.03, "≤", 0, "≥", 0, ">", 0.03];
testfilling1 = Switch[filling1,
  None, False,
  Top, Switch[ineq1, ">", True, "≥", True, "<", False, "≤", False],
  Bottom, Switch[ineq1, "<", True, "≤", True, ">", False, "≥", False]
  ];
testfilling2 = Switch[filling2,
  None, False,
  Top, Switch[ineq2, ">", True, "≥", True, "<", False, "≤", False],
  Bottom, Switch[ineq2, "<", True, "≤", True, ">", False, "≥", False]
  ];
Plot2 = Plot[m2 x + b2, {x, -13, 13}, Filling -> filling2,
  FillingStyle -> {{Red, Opacity[0.5]}, {Red, Opacity[0.5]}}, PlotStyle -> {Dashing -> dashing2, Red},
  PlotStyle -> Dashed, PlotRange -> 13];
If[showresult,
  Show[Graphics[Text[Style[If[testfilling1 && testfilling2, "Good Job!", "Try Again"], 36]]],
  Show[Plot1, Plot2, Graphics[Text["(" <> ToString[pt[[1]]] <> ", " <> ToString[pt[[2]]] <> ")", pt, {-2, 0}]],
  PlotRange -> 13, ImageSize -> {500, 300}
  ],
  {{pt, {0, 0}}, {-10, -10}, {10, 10}, {1, 1}, Locator},
  Grid[{{"
  Button["Check", showresult = True, Background -> Green],
  Button["Start Over", showresult = False; filling1 = None; filling2 = None, Background -> Red]}}],
  Grid[
  {
  {
  "blue slope",
  Control[{{m1, -2.5, ""}, -10., 10., .5, Appearance -> "Labeled", ImageSize -> Medium}],
  PopupMenu[Dynamic[ineq1], {"<", "≤", ">", "≥"}], , ,
  Button["shade blue", filling1 = If[pt[[2]] > m1 pt[[1]] + b1, Top, Bottom]]
  },
  {
  "blue y-intercept", Control[{{b1, 7.0, ""}, -10., 10., 1, Appearance -> "Labeled", ImageSize -> Medium]}
  },
  {
  "red slope",
  Control[{{m2, 5.0, ""}, -10., 10., .5, Appearance -> "Labeled", ImageSize -> Medium}],
  PopupMenu[Dynamic[ineq2], {"<", "≤", ">", "≥"}], , ,
  Button["shade red", filling2 = If[pt[[2]] > m2 pt[[1]] + b2, Top, Bottom]]
  },
  {
  "red y-intercept", Control[{{b2, -2.0, ""}, -10., 10., 1, Appearance -> "Labeled", ImageSize -> Medium]}
  }
  ]
  ],
  {{filling1, None}, {None, Top, Bottom}, ControlType -> None},
  {{filling2, None}, {None, Top, Bottom}, ControlType -> None},
  {{showresult, False}, {False, True}, ControlType -> None},
  AutorunSequencing -> {1, 2, 3, 4, 5},
  ControlPlacement -> {Top, Bottom, Top}, LabelStyle -> {14, "TraditionalForm"}]

```

blue slope + -2.5

blue y-intercept + 7.

red slope + 5.

red y-intercept + -2.

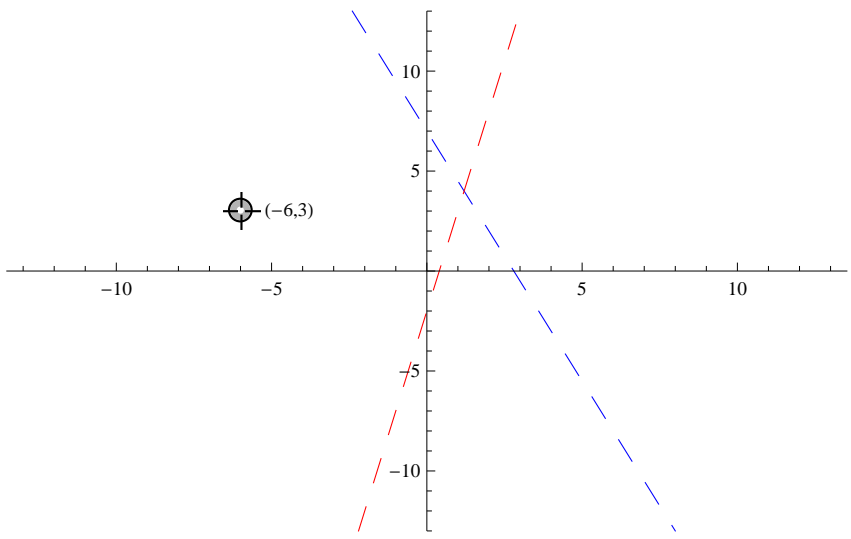
▼

shade blue

▼

shade red

$$y_1 < -2.50 x_1 + 7.00$$

$$y_2 < 5.00 x_2 - 2.00$$


Check

Start Over

Caption

This demonstration allows you to input a system of inequalities that will be graphed for you. Using a locator you can then choose test points for each inequality and shade on the side of the locator. Mathematica will then check your solution and provide immediate feedback.

Thumbnail

blue slope -3. < ▼ shade blue

blue y-intercept 4.

red slope -10. < ▼ shade red

red y-intercept 10.

$y_1 < -3.00 x_1 + 4.00$
 $y_2 < -10.00 x_2 + 10.00$

Check Start Over

Snapshots

blue slope

blue y-intercept

red slope

red y-intercept

$y_1 < -4.50 x_1 + 1.00$
 $y_2 < 6.50 x_2 - 7.00$



blue slope

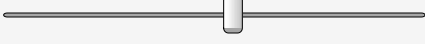
blue y-intercept



red slope


red y-intercept

$y_1 < -4.50 x_1 + 1.00$
 $y_2 < 6.50 x_2 - 7.00$

blue slope  + -4.5 <  shade blue

blue y-intercept  + 1.

red slope  + 6.5 <  shade red

red y-intercept  + -7.

Try Again

Check
Start Over

Details (optional)

Control Suggestions (optional)

- Resize Images
- Rotate and Zoom in 3D
- Drag Locators
- Create and Delete Locators
- Slider Zoom
- Gamepad Controls
- Automatic Animation
- Bookmark Animation

Search Terms (optional)

graphing systems of inequalities
 inequalities
 graphing
 Indiana Core 40 test

Authoring Information

Contributed by: Tori Thomas and Amber Glon
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