Pre-calculus Workbook For Dummies

Errata

Cheat Sheet, page 2:

Product-to-sum formulas:

Existing formulas should be replaced with:

$$\sin x \cdot \sin y = \frac{1}{2}\left[\cos(x - y) - \cos(x + y)\right]$$

$$\cos x \cdot \cos y = \frac{1}{2}\left[\cos(x + y) + \cos(x - y)\right]$$

$$\sin x \cdot \cos y = \frac{1}{2}\left[\sin(x + y) + \sin(x - y)\right]$$

Sum to product:

$$\sin x \pm \sin y = 2\sin\left(\frac{x \pm y}{2}\right)\cos\left(\frac{x \pm y}{2}\right)$$

Should be replaced with:

$$\sin x \pm \sin y = 2\sin\left(\frac{x \pm y}{2}\right)\cos\left(\frac{x \mp y}{2}\right)$$

Chapter 1, page 10, #4:

Simplify: $\dfrac{|5\ \ 1-4\ \ \ +6|}{3\left(-\frac{1}{6}+\frac{1}{3}\right)-\frac{1}{2}}$

Should be replaced with

Simplify: $\dfrac{|5(1-4)+6|}{3\left(-\frac{1}{6}+\frac{1}{3}\right)-\frac{1}{2}}$.

Chapter 1, page 20, #4:

Simplify $\dfrac{|5\ \ 1-4\ \ \ +6|}{3\left(-\frac{1}{6}+\frac{1}{3}\right)-\frac{1}{2}}$.

Should be replaced with:

Simplify: $\dfrac{\left|5\left(1-4\right)+6\right|}{3\left(-\frac{1}{6}+\frac{1}{3}\right)-\frac{1}{2}}$.

Make this correction twice: in the short answer and answer explanation.

Chapter 2, page 29, example #1:

Q: Write the solution for 5-2x > 4 in interval notation.

A: $\left(1/2,\infty\right)$

The answer should be replaced with:

$\left(-\infty,1/2\right)$

Chapter 2, page 36, #4:

Solve for x in $x^3 - 5x > 4x^2$. The answer is $x > 1$ or $0 > x > -5$.

First, if you need a refresher on solving polynomials and quadratics, skip ahead to Chapter 4. For this problem, start by gathering all your variables to one side of the equation by subtracting $4x^2$ from each side: $x^3 + 4x^2 - 5x > 0$. Next, factor out x from each term: $x(x^2 + 4x - 5) > 0$. Then factor the quadratic: $x(x - 5)(x - 1) > 0$. Setting your factors equal to 0, you can find you key points. Put these points on a number line. Plug in test numbers from each possible section to determine whether the factor would be positive or negative. Then, given that you're looking for a positive solution, think about the possibilities: (+)(+)(+) = (+),(+)(+)(–) = (–),(–)(+)(–) = (+),(–)(–)(–) = (–). Therefore, your solution is $x > 1$ or $0 > x > -5$.

Should be replaced with:

Solve for x in $x^3 - 5x > 4x^2$. The answer is $-1 < x < 0$ or $x > 5$.

First, if you need a refresher on solving polynomials and quadratics, skip ahead to Chapter 4. For this problem, start by gathering all your variables to one side of the equation by subtracting $4x^2$ from each side: $x^3 - 4x^2 - 5x > 0$. Next, factor out x from each term: $x(x^2 - 4x - 5) > 0$. Then factor the quadratic: $x(x-5)(x+1) > 0$. Setting your factors equal to 0, you can find you key points. Put these points on a number line. Plug in test numbers from each possible section to determine whether the factor would be positive or negative. Then, given that you're looking for a positive solution, think about the possibilities: (+)(+)(+) = (+),(+)(+)(–) = (–),(–)(+)(–) = (+),(–)(–)(–) = (–). Therefore, your solution is $-1 < x < 0$ or $x > 5$.

Chapter 2, page 36, #6:

Write the solution of $x^3 - 5x > 4x^2$ in interval notation, and graph the solution on a number line. The answer is $\left(-5,0\right)\cup(1,\infty)$.

Should be replaced with:

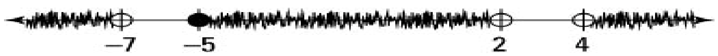
Write the solution of $x^3 - 5x > 4x^2$ in interval notation, and graph the solution on a number line. The answer is $(-1,0)\cup(5,\infty)$.

And the graph should look like:

Chapter 2, page 37, #7:

Graph the interval set $(-\infty,-7)\cup[-5,2)\cup(4,\infty)$ on a number line.

The graph should look like this:



Chapter 2, page 37, #8:

Graph the solution of $|2x-1|\leq 3$.

Start by dropping the absolute value sign and setting up your two equations: $2x - 1 \leq 3$ and $2x - 1 \geq -3$. Then solve each to find your solution: $2x \leq 4$ and $2x \geq -2$; $x \leq 2$ and $x \geq -1$.These can also be rewritten as $-1 \leq x \geq 2$, which can be graphed as follows:

Should be replaced with:

Graph the solution of $|2x-1|\leq 3$.

Start by dropping the absolute value sign and setting up your two equations: $2x - 1 \leq 3$ and $2x - 1 \geq -3$. Then solve each to find your solution: $2x \leq 4$ and $2x \geq -2$; $x \leq 2$ and $x \geq -1$.These can also be rewritten as $-1 \leq x \leq 2$, which can be graphed as follows:

And the graph should look like this:

Chapter 6, page 115, Lines 9-10:

Recalling 30-60-90 triangles, the sides are in the ratio of $1:\sqrt{3:2}$. Therefore, if you want the hypotenuse to be 1, as it is in the unit circle, divide each side by 2.

Should be replaced with:

Recalling 30-60-90 triangles, the sides are in the ratio of $1:\sqrt{3}:2$. Therefore is you want the hypotenuse to be 1, as it is in the unit circle, divide each side by 2, giving you $\frac{1}{2}:\frac{\sqrt{3}}{2}:1$.

Chapter 6, page 124, #13, Line 4:

Now plug into your trig ratios and rationalize if necessary: $\sin\theta = 2\,\frac{\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$; …

Should be replaced with:

Now plug into your trig ratios and rationalize if necessary: $\sin\theta = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$; …

Chapter 6, page 124, #14, Line 4:

Plug into your trig ratios and rationalize if necessary: $\sin\theta = -3\,\frac{\sqrt{5}}{9} = -\frac{\sqrt{5}}{3}$; $\cos\theta = \frac{6}{9} = \frac{2}{3}$; $\tan\theta = -3\,\frac{\sqrt{5}}{6} = -\frac{\sqrt{5}}{2}$; …

Should be replaced with:

Plug into your trig ratios and rationalize if necessary: $\sin\theta = \frac{-3\sqrt{5}}{9} = -\frac{\sqrt{5}}{3}$; $\cos\theta = \frac{6}{9} = \frac{2}{3}$; $\tan\theta = \frac{-3\sqrt{5}}{6} = -\frac{\sqrt{5}}{2}$; …

Chapter 6, page 125, #17, Line 5:

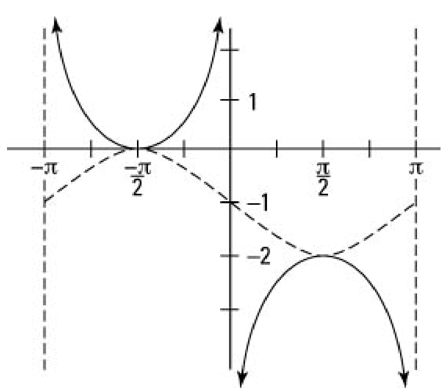
…Using the point-in-plane definition, you get $\sin\theta = x = -\frac{1}{2}$; $\sqrt{\cos\theta} = y =$… … $\sqrt{\sec\theta} = 1/x =$ …

Should be replaced with:

the point-in-plane definition, you get $\sin\theta = x = -\frac{1}{2}$; $\cos\theta = y =$… … $\sec\theta = 1/x =$ …

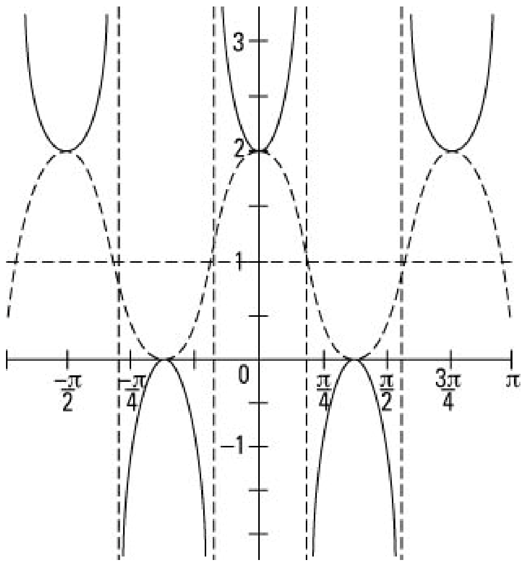
Chapter 7, page 141, #13:

Graph should be replaced with:



Chapter 7, page 141, #14:

Graph should be replaced with:



Chapter 9, page 165, Q&A, last 5 lines of Answer:

… This simplifies to $\sqrt{3}$. But wait – we're not done! This is the value of $\tan\frac{5\pi}{12}$, and we need $\cot\sqrt{3}$. …

Should be replaced with:

… This simplifies to $2+\sqrt{3}$. But wait – we're not done! This is the value of $\tan\frac{5\pi}{12}$, and we need $\cot\frac{5\pi}{12}$. …

Chapter 9, page 169, Q&A, Answer:

…After rewriting $(\cos^2 x)^2$, you can see that you need to use the power-reducing formula twice. The first time gives you

$$\left(\frac{1+\cos 2x}{2}\right)^2 = \left(\frac{1+\cos 2x}{2}\right)\left(\frac{1+\cos 2x}{2}\right) = \frac{1+2\cos 2x+\cos^2 x}{4} = \frac{1}{4}\left(1+2\cos 2x+\cos^2 x\right)$$

The equation should be replaced with:

$$\left(\frac{1+\cos 2x}{2}\right)^2 = \left(\frac{1+\cos 2x}{2}\right)\left(\frac{1+\cos 2x}{2}\right) = \frac{1+2\cos 2x+\cos^2 2x}{4} = \frac{1}{4}\left(1+2\cos 2x+\cos^2 2x\right)$$

Chapter 10, page 182, Q&A Explanation:

Now that you have the picture, you can figure out whether you need to use the Law of Sines or the Law of Cosines. Because this is SAS, you start off with the modified Law of Cosines, using the different variables from the picture: $t^2 = s^2 + e^2 - 2se\cos T$, or $t^2 = 700^2 + 300^2 - 2(700)(300)\cos 45$. …

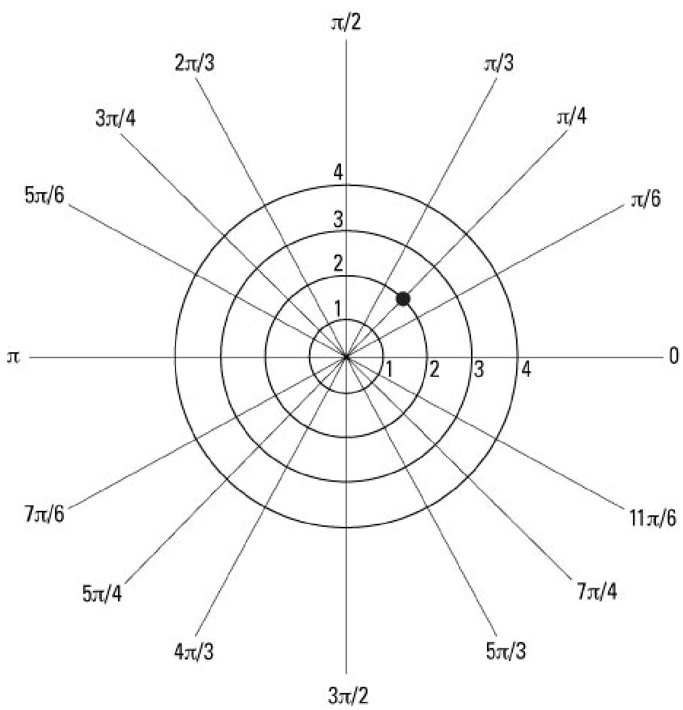
The last part of the equation should be replaced with:

$$t^2 = 700^2 + 300^2 - 2(700)(300)\cos 135°$$

Chapter 11, page 200, Question:

What's the polar coordinate of point P in the following figure?

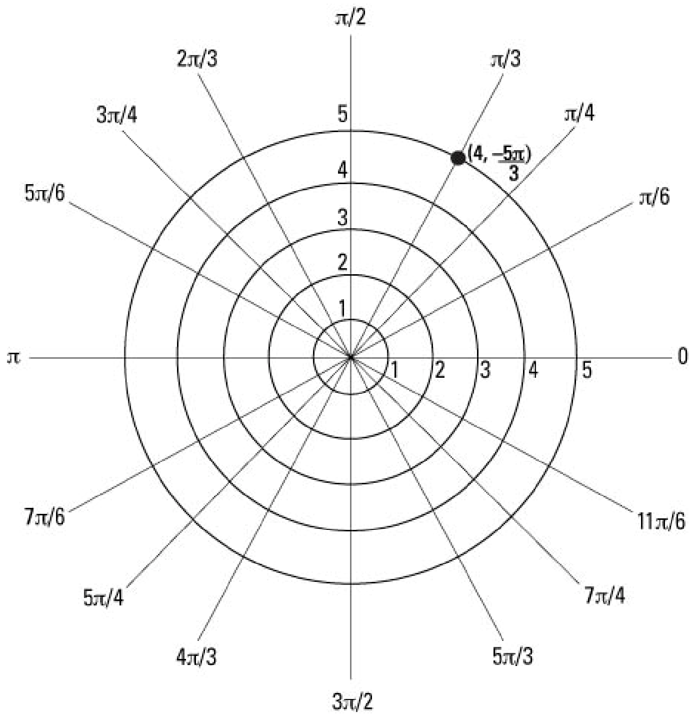
The graph should be replaced with:



Chapter 11, page 207, #5:

The radius is 4 and the angle is negative, which moves in a clockwise direction and ends up in the first quadrant.

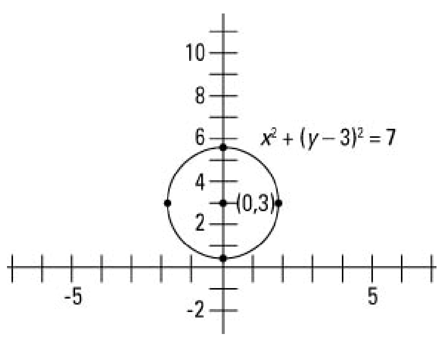
The graph should be replaced with:



Chapter 12, page 213, Figure 12-1:

Graphing a circle: Mark the center first, and then mark the radius in all directions.

The figure should be replaced with:



Chapter 12, page 215, 2nd Q&A, Answer:

Vertex: (2/3, -1/3); axis of symmetry: x = 2/3; focus: (2/3, -1/4): directrix: y = -1/12. That's an awful lot of fractions, ain't it? But the process doesn't change. Start by subtracting 1 from both sides: $y - 1 = 3x^2 - 4x$. Then factor out the three: $y - 1 = 3(x^2 - 4/3x)$. Now complete the square and be sure to keep the equation balanced: $y - 1 + 4/3 = 3(x^2 - 4/3x + 4/9)$. …

Should be replaced with:

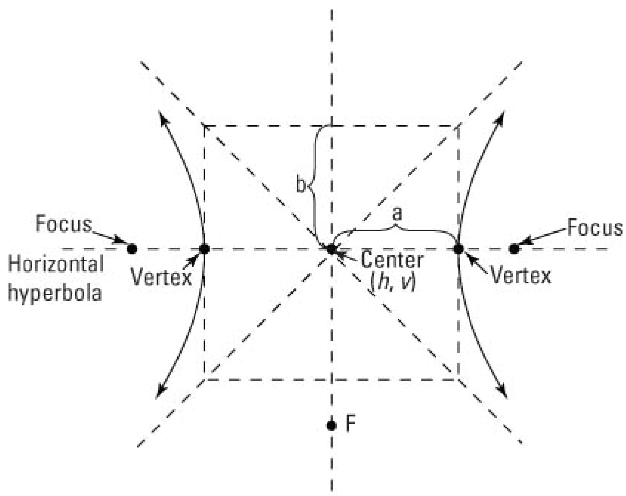
Then factor out the three: $y-1=3\left(x^2-\frac{4}{3}x\right)$.

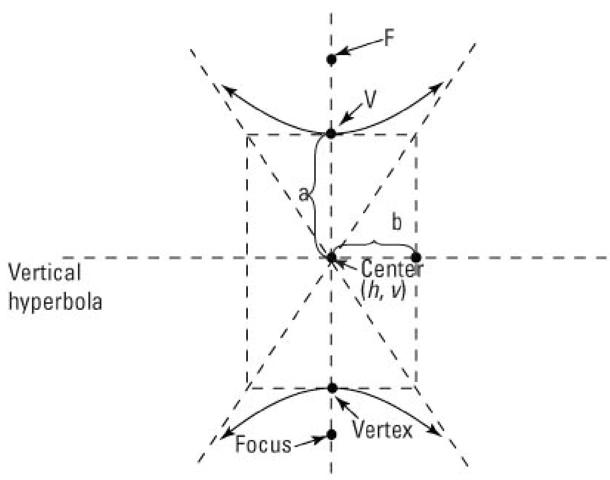
Now complete the square and be sure to keep the equation balanced: $y-1+\frac{4}{3}=3\left(x^2-\frac{4}{3}x+\frac{4}{9}\right)$.

Chapter 12, page 223, Figure 12-8:

Horizontal and vertical hyperbolas and their parts:

Figures should be replaced with:

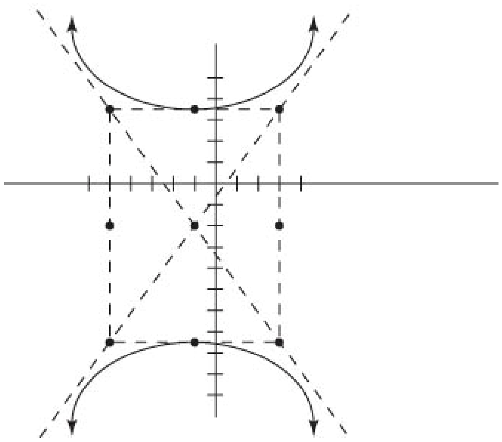




Chapter 12, page 226, Figure 12-10:

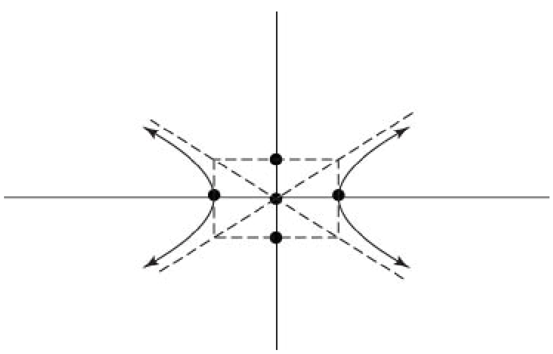
Graphing a vertical hyperbola.

Figure should be replaced with:



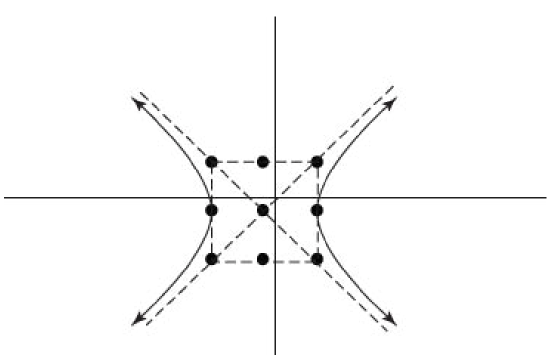
Chapter 12, page 238, #12:

Answer graph should be replaced with:



Chapter 12, pages 240-241, #20:

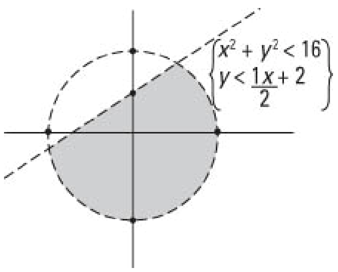
Answer graph should be replaced with:



Chapter 13, page 252, Figure 13-2:

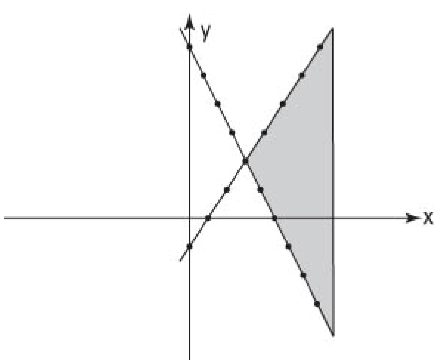
Another graph of a system of inequalities; this time, one equation isn't linear.

Figure should be replaced with:



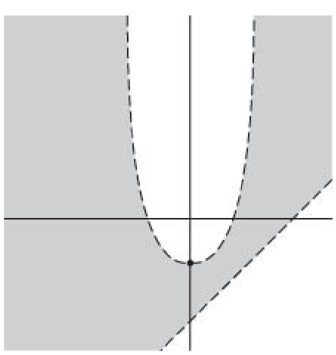
Chapter 13, page 268, #15:

Answer graph should be replaced with:



Chapter 13, page 269, #17:

Answer graph should be replaced with:

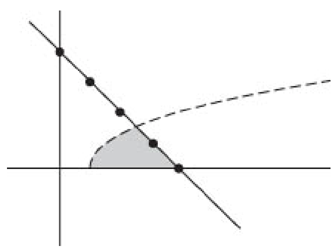


Chapter 13, page 269, #18:

Replace question with the following:

Sketch the graph of $\begin{cases} y \ge 0 \\ x + y < 4 \\ y < \sqrt{x-1} \end{cases}$.

Answer graph should be replaced with:



Chapter 14, page 276, Second Example, Answer:

$a_n = (-1)^n \dfrac{n}{n \quad 1}$.

Should be replaced with:

$a_n = (-1)^n \dfrac{n}{n+1}$

Be sure to make this correction twice: in the answer and in its written explanation.

Chapter 17, page 311, Oversimplifying Roots:

Delete the long equation at the end of the second line, so the text becomes: "Or $\sqrt[3]{2}$ becomes $\sqrt{2}$, losing the index on the root. … "