

The Sign Chart can be used as a method of solving a Rational Inequality.

Solve for x, using interval form: $\frac{2x^2 - 7x - 15}{2x^3 - x^2 - 7x + 6} \leq 0$

1. Factored Form: $\frac{(x-5)(2x+3)}{(x-1)(x+2)(2x-3)}$ Critical Values: 5, -3/2, 1, -2, 3/2

Make a Sign Chart, using the Critical Values as Separators in Ascending Order from $-\infty$ to ∞

	$-\infty$	-2	-3/2	1	3/2	5	∞
x - 5	-	-	-	-	-	-	+
2x + 3	-	-	+	+	+	+	+
x - 1	-	-	-	+	+	+	+
x + 2	-	+	+	+	+	+	+
2x - 3	-	-	-	-	-	+	+
Signs	-	+	-	+	-	+	+

Solution: x belongs to the intervals: $\boxed{(-\infty, -2) \cup [-3/2, 1), \cup (3/2, 5]}$

Law of Sines: in $\triangle ABC$, $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Law of Cosines: in $\triangle ABC$, $a^2 = b^2 + c^2 - 2bc \cos A$

1. In $\triangle PRQ$, p = 5, r = 10, Q = 21°. Find q accurate to 5 decimal places.

$$q^2 = 25 + 100 - 2(5)(10) \cos 21^\circ$$

$$q^2 = 31.642 \text{ Store this value before moving on.}$$

$$q = \boxed{5.62512}$$

2. In $\triangle RLM$, R = 41°, r = 16 L = 61°. Find l accurate to 5 decimal places.

$$\frac{l}{\sin 61^\circ} = \frac{16}{\sin 41^\circ}$$

$$l = \frac{16 \sin 61^\circ}{\sin 41^\circ} = \boxed{21.33027}$$

3. In $\triangle BAE$, b = 8, a = 11, e = 13. Find A accurate to 5 decimal places.

$$121 = 64 + 169 - 2(8)(13) \cos A$$

$$2(8)(13) \cos A = 64 + 169 - 121$$

$$\cos A = \frac{64 + 169 - 121}{2(8)(13)}$$

$$A = \arccos \left[\frac{64 + 169 - 121}{2(8)(13)} \right] = \boxed{57.42103}$$

4. In $\triangle DBA$, d = 60, b = 70, B = 80°. Find D accurate to 5 decimal places.

$$\frac{\sin D}{60} = \frac{\sin 80^\circ}{70}$$

$$\sin D = \frac{60 \sin 80^\circ}{70}$$

$$D = \arcsin \left(\frac{60 \sin 80^\circ}{70} \right) = \boxed{57.57787}$$

1. In $\triangle ABC$, $A = 32^\circ$, $C = 42^\circ$, $b = 56.123$. Find a .

2. In $\triangle ABC$, $A = 46^\circ$, $b = 42$, $c = 57$. Find a .

3. In $\triangle ABC$, $a = 14$, $b = 17$, $c = 30$. Find B .

4. In $\triangle DRQ$, $Q = 121^\circ$, $q = 201$, $R = 221^\circ$. Find r .

5. Solve, using interval notation: $\frac{x^2 - x - 6}{x^2 + 2x - 3} \geq 0$

6. Solve, using interval notation: $\frac{2x^2 - 11x + 15}{3x^2 + x - 2} < 0$

7. Solve, using interval notation: $\frac{3x^3 - 9x^2 - 12x}{4x^2 - 18x - 10} > 0$

8. Solve, using interval notation: $\frac{2x^3 + 3x^2 - 2x - 3}{x^2 + x - 2} \leq 0$

9. Point (7, 19) is on the terminal side of angle θ . Find $\cos \theta$.

10. $f(x) = 3x^2 + x - 1$. Find the Difference Quotient.