Week 25 Algebra 2 Assignment:

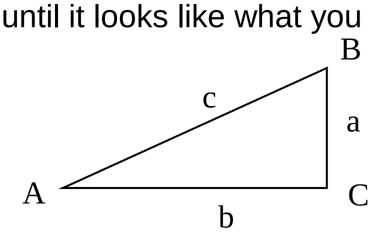
Day 1: pp. 460 #1-14, 20-23
Day 2: pp. 466-467 #1-12
Day 3: pp. 466-467 #13-19, 27
Day 4: pp. 472-473 #1-16
Day 5: pp. 472-473 #17-25

Notes on Assignment:

Page 460:

General notes for this section: When verifying trig identities, always start with an equation that sets something equal to itself. (We can do this because of the Reflexive Property.) Then work with the right side until it looks like what you are trying to verify.

Example: Verify that $\tan A = \dfrac{\sin A}{\cos A}$



Verification:

$$\begin{aligned}\frac{\sin A}{\cos A} &= \frac{\sin A}{\cos A}\\ &= \frac{\frac{a}{c}}{\frac{b}{c}}\\ &= \frac{a}{c}\cdot\frac{c}{b}\\ &= \frac{a}{b}\\ &= \tan A\end{aligned}$$

Work to show:
- #1-14: Show all steps
- #20-24: Show work.

#2-3: For both of these, start with the left side equal to itself.

#4-9: Take these expressions and work with them to simplify them by making some substitutions using the different identities given in this section.

#4: Remember that the Pythagorean Identities have a couple of alternative forms:

$$\sin^2\theta + \cos^2\theta = 1 \qquad \cos^2\theta = 1 - \sin^2\theta \qquad \sin^2\theta = 1 - \cos^2\theta$$

Try substituting ($1-\cos^2\theta$) in for the $\sin^2\theta$ in this problem and see what happens.

#7-8: Sometimes it is helpful to write everything in terms of sine and cosine.

#10-14: Set the first expression equal to itself and then work with the right side to get it to look like the expression you are trying to get. Don't leave out steps, as each step is part of the solution.

#10: Use the Pythagorean identities.

#11: Change secant and cosecant into their reciprocal identities and then simplify the complex fraction. What you end up with should be close to what you are trying to get. You will see what I mean.

#12: Use the Pythagorean identities.

#13: Write everything in terms of sine and cosine.

#14: Use the Pythagorean identities and then the reciprocal identities.

#20-23: These are all quadratics. You can solve them by factoring, completing the square, or the quadratic formula.

#24: Decide where this polynomial will equal zero by factoring first. On your number line, take those critical points and make "walls". Write down each binomial factor and the sign that it will take on in each interval. Since we want the product to be <0, (i.e. negative) we are looking for the interval(s) where we have one negative and one positive.

Pages 466-467:

Work to show:

#1-8: Answer as directed.
#9-19: Show all steps for proving identities.
#27: Synthetic or long division.

#1-5: You are being asked what property or identity you are using to get to that step from the one above it.

#7-8: Start with setting one side equal to itself. It is often the best to use the most complicated of the 2 sides given.

#9-10: Try putting everything in terms of sine and cosine, getting a common denominator so you can add the resulting fractions, and then simplify.

#11-12: Multiply out using the Distributive property first.

#13: Start with the right side and use a Pythagorean identity.

#14-19: You are on your own. The best way to get good at these is to muddle through and try different approaches!

#27: You know that the zeros have to be factors of the constant, 6. Try all of the factors of 6 in the function and see which gives you zero.

<u>Pages 472-473</u>:

Work to show:

#1-12: Show numbers in formulas and then show work.

#13-25: Show all steps in proving identities.

#1: You know that $\sin^2 A + \cos^2 A = 1$, so put in $\frac{3}{5}$ for $\cos A$ and solve for $\sin A$.

#2: Use your answer to #1 and the formula $\cos 2A = \cos^2 A - \sin^2 A$.

#3: Use your answer to #1 and the formula $\sin 2A = 2\sin A \cos A$.

#4: Do this the same way you did #1, but this time, the angle is said to be in quadrant II. This means that after you find the value for $\cos B$ you will have to put a negative on it, since cosine is negative in quadrant II.

#5-6: Use the formulas listed above.

#7-10: Write these angle measures as the sum or difference of angles you know from your unit circle. Then use the sum and difference formulas on page 469.

#11-12: You need to use both of the triangles for both problems. To use the sum and difference formulas you will need to find the $\sin\alpha, \cos\alpha, \sin\beta, \cos\beta$.

#13-14: Work with the right side.

#15: Work with the left side. Change to sine and cosine, get a common denominator, and then see what you can do using a Pythagorean identity.

#16: Work with the left side. Hint: Look at the denominator. You can get a Pythagorean identity if you multiply by 1 in the form of the $\frac{conjugate}{conjugate}$.

#17: Take the left side and put it into the sum formula.

#18: Start with the left side.

#19: Think of the left side as $\sin 2(4x)$ and put it into the formula for $\sin 2\theta = 2\sin\theta\cos\theta$.

#20-21: Take the left side and put it into a sum or difference formula.

#22: Think of the left side as $\cos 2(2x)$ and put it into the formula for $\cos 2\theta = \cos^2\theta - \sin^2\theta$.

#23: Start with the left side and write it as $\frac{\sin 2x}{\cos 2x}$. Expand these using the double angle formulas above.

#24: Factor the left side.

#25: Start with the left side and use the difference formula. Be careful with the parentheses and subtraction.