Math 30-1

Chapter 5 and 6 Assignment

Trigonometry

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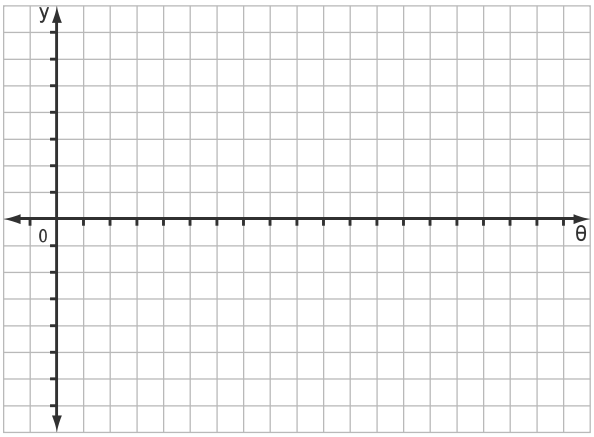
Name: _____

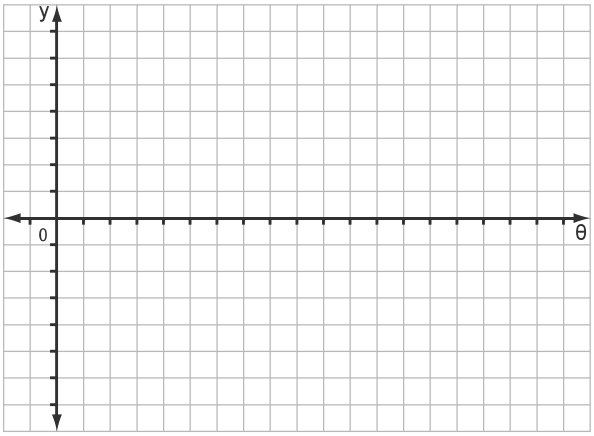
Chapter 5 Review

5.1 Graphing Sine and Cosine Functions, pages 149–157

1. Graph at least two cycles of $y = 3\cos\left(\frac{1}{2}\theta\right)$. State the amplitude and period in degrees.



2. Graph at least two cycles of $y = -0.5\sin(2\theta)$. State the amplitude and period in radians.



3. Without graphing, determine the amplitude and period, in radians and in degrees, of each function.

a) $y = 2\sin 3x$

b) $y = \frac{1}{3}\cos x$

c) $y = \frac{3}{4}\cos 2x$

d) $y = -4\sin\frac{2}{3}x$

5.2 Transformations of Sinusoidal Functions, pages 158–166

4. Determine the amplitude, period, phase shift, and vertical displacement with respect to $y = \sin x$ or $y = \cos x$ for each function.

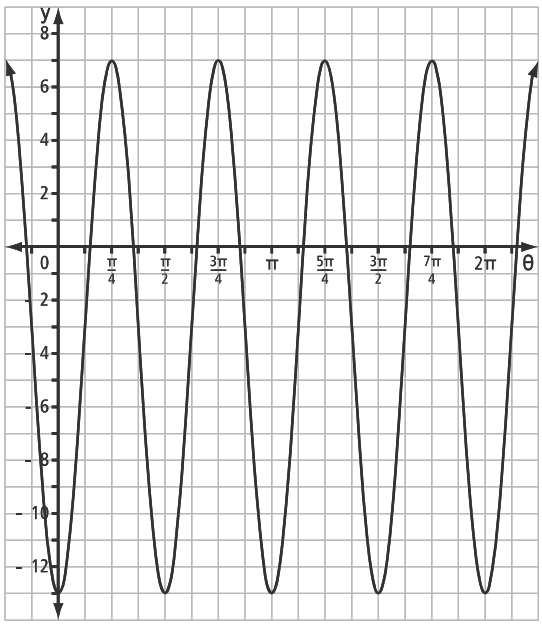
a) $y = 5 \sin \frac{1}{4}\left(x + \frac{\pi}{3}\right) - 1$

b) $y = -\frac{1}{2} \cos 2(x - \pi) - 3$

c) $y = 3 \cos 4(x + 50°) + 6$

5. Graph at least two cycles of $y = \sin 2\left(x + \frac{\pi}{12}\right) - 0.4$.

6. Write two equations of the form $y = a \cos b(\theta - c) + d$ that represent the function shown below.

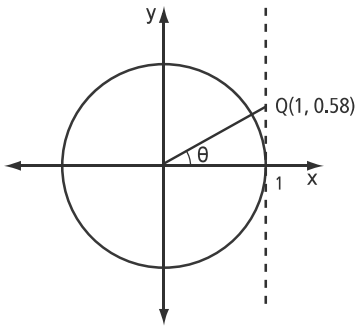


5.3 The Tangent Function, pages 167–174

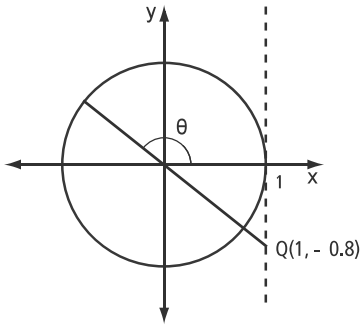
7. Graph $y = \tan x$ over the domain $-\frac{3\pi}{2} \leq x \leq \frac{5\pi}{2}$.

8. For each diagram, determine $\tan \theta$ and the value of θ, in degrees. If necessary, round your answer to the nearest tenth.

a)



b)



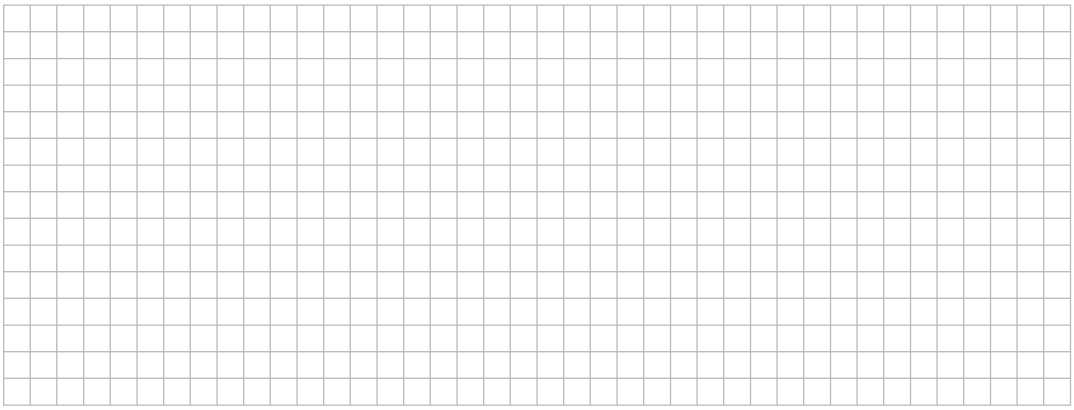
5.4 Equations and Graphs of Trigonometric Functions, pages 175–182

9. Write a sinusoidal function to model the average temperature in Nanaimo, BC.

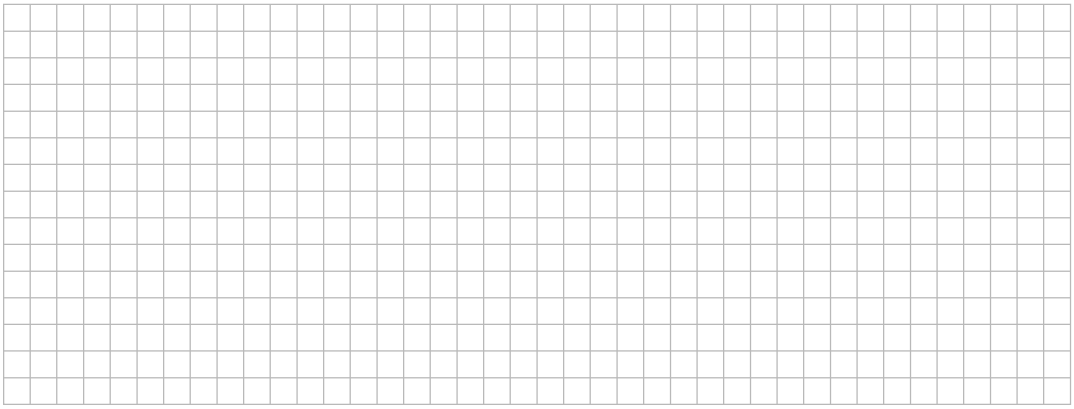
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°C	1.9	3.6	5.3	8.1	11.8	14.9	17.3	17.2	14.2	9.4	5.1	2.8

10. Solve each equation by graphing.

a) $\sin 2x = 0, 0 \leq x \leq 2\pi$



b) $\cos\left(x + \frac{\pi}{2}\right) + 1 = 0, 0 \leq x \leq 2\pi$



c) $\sin 2(x - 30°) + 0.5 = 0$, general solution in degrees

Chapter 6 Review

6.1 Reciprocal, Quotient, and Pythagorean Identities, pages 188–196

1. Determine the non-permissible values of x, in radians, for each expression.

a) $\frac{\sec x}{\sin x}$

b) $\frac{\cos x}{\csc x}$

c) $\frac{\sec x}{1 + \cos^2 x}$

2. Simplify each expression to one of the three primary trigonometric functions: $\sin x$, $\cos x$, or $\tan x$.

a) $\frac{\cos x \csc x}{\sec x \cot x}$

b) $\frac{\cot x \tan x}{\csc x}$

3. Simplify. Then, rewrite each expression as one of the three reciprocal trigonometric functions: $\csc x$, $\sec x$, or $\cot x$.

a) $\cot x \sec x$

b) $\frac{\cos x}{(1 - \sin x)(1 + \sin x)}$

4. a) Verify that the equation $(\sec x + \tan x)\cos x - 1 = \sin x$ is true for $x = 30°$ and for $x = \frac{\pi}{3}$.

b) What are the non-permissible values of the equation in part a) in the domain $0° \leq x < 360°$?

6.2 Sum, Difference, and Double-Angle Identities, pages 197–204

5. Write each expression as a single trigonometric ratio. Then, give an exact value for the expression.

a) $\cos^2 15° - \sin^2 15°$

b) $\sin 35° \cos 100° + \cos 35° \sin 100°$

c) $1 - 2\sin^2 75°$

6. Determine the exact value of each trigonometric expression.

a) $\sin\left(-\frac{\pi}{12}\right)$

b) $\cos\frac{\pi}{12}$

c) $\cos 105°$

d) $\sin\frac{23\pi}{12}$

7. Angle θ is in quadrant II and $\sin\theta = \frac{7}{25}$. Determine an exact value for each of the following.

a) $\sin 2\theta$

b) $\cos 2\theta$

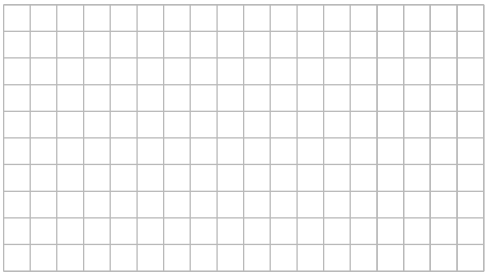
c) $\tan 2\theta$

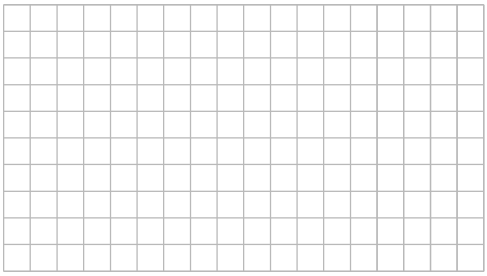
6.3 Proving Identities, pages 205–214

8. Prove $\sin(\pi - x) - \tan(\pi + x) = \dfrac{\sin x(\cos x - 1)}{\cos x}$.

9. Consider the equation $\sin^2 x + \tan^2 x + \cos^2 x = \sec^2 x$.

a) Graph each side of the equation. Could the equation be an identity? Explain.





b) Either prove that the equation is an identity or find a counterexample to show that it is not an identity.

10. Prove each identity.

a) $\cos x \tan^2 x = \sin x \tan x$

b) $\sin 2x = \tan x + \tan x \cos 2x$