

Ch. 10 BOARD PROBLEMS

PROVE.

$$\textcircled{1} \quad \frac{\cos x}{\sec x - 1} - \frac{\cos x}{\tan^2 x} = \cot^2 x$$

$$\textcircled{2} \quad \frac{\sec x}{\sec x - \tan x} = \sec^2 x + \sec x \tan x$$

$$\textcircled{3} \quad (\sin \theta + \cos \theta)^2 + (\sin \theta - \cos \theta)^2 = 2$$

$$\textcircled{4} \quad \frac{1 - \tan^2 x}{1 + \tan^2 x} = 1 - 2 \sin^2 x$$

Put into vertex FORM AND Graph

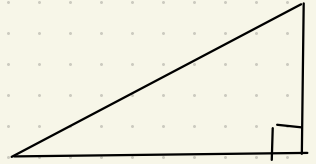
$$\textcircled{5} \quad x^2 - 12x + y + 40 = 0$$

$$\textcircled{6} \quad y = (x+5)(x+4)$$

Ch. 10 - SOLVING TRIGONOMETRIC FUNCTIONS

EVALUATE IN EXACT FORM.

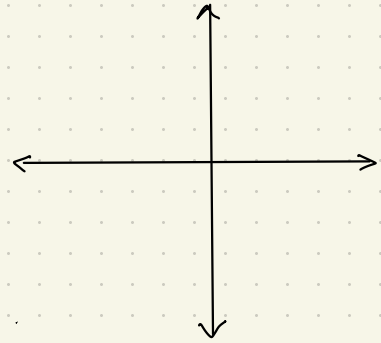
① $5 \sin 60^\circ - 3 \cos 30^\circ =$



② $\tan 60^\circ - \cos 30^\circ =$

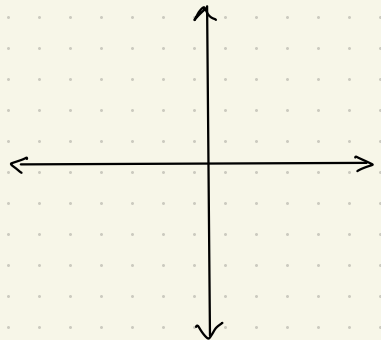
③ VERIFY.

$$\sin^2(120^\circ) + \cos^2(300^\circ) = 1$$



④ $\sin^2(45^\circ) + \cos^2(225^\circ) = 1$

⑤ $\tan 240^\circ = \frac{2 \tan 300^\circ}{1 - \tan^2(120^\circ)}$



PRACTICE PROBLEMS

1. $\cos 60^\circ + 2\sin 45^\circ =$

2. $\sec 45^\circ + 2\cot 45^\circ =$

3. $3\tan 45^\circ - 2\cos 45^\circ =$

4. $\sin^2 30^\circ + \cos^2 30^\circ = 1$

5. $\sin 240^\circ = -2\sin 120^\circ - \sin 300^\circ$

6. $\tan 240^\circ = \frac{2\tan 300^\circ}{1 - \tan^2 120^\circ}$

Evaluating Functions

Date_____ Period____

Evaluate each function.

1) $h(t) = |t + 2| + 3$; Find $h(6)$

2) $g(a) = 3^{3a-2}$; Find $g(1)$

3) $w(t) = -2t + 1$; Find $w(-7)$

4) $g(x) = 3x - 3$; Find $g(-6)$

5) $h(n) = -2n^2 + 4$; Find $h(4)$

6) $h(t) = -2 \cdot 5^{-t-1}$; Find $h(-2)$

7) $f(x) = x^2 - 3x$; Find $f(-8)$

8) $p(a) = -4^{3a}$; Find $p(-1)$

9) $p(t) = 4t - 5$; Find $p(t - 2)$

10) $g(a) = 4a$; Find $g(2a)$

11) $w(n) = 4n + 2$; Find $w(3n)$

12) $w(a) = a + 3$; Find $w(a + 4)$

13) $h(x) = 4x - 2$; Find $h(x + 2)$

14) $k(a) = -4^{3a+2}$; Find $k(a - 2)$

15) $g(n) = n^3 - 5n^2$; Find $g(-4n)$

16) $f(n) = n^2 - 2n$; Find $f(n^2)$

17) $p(a) = a^3 - 5$; Find $p(x - 4)$

18) $h(t) = 2 \cdot 3^{t+3}$; Find $h(4 + t)$

Function Operations

Perform the indicated operation.

1) $g(n) = n^2 + 4 + 2n$
 $h(n) = -3n + 2$
Find $(g \cdot h)(1)$

2) $f(x) = 4x - 3$
 $g(x) = x^3 + 2x$
Find $(f - g)(4)$

3) $h(x) = 3x + 3$
 $g(x) = -4x + 1$
Find $(h + g)(10)$

4) $g(a) = 3a + 2$
 $f(a) = 2a - 4$
Find $\left(\frac{g}{f}\right)(3)$

5) $g(x) = 2x - 5$
 $h(x) = 4x + 5$
Find $g(3) - h(3)$

6) $g(a) = 2a - 1$
 $h(a) = 3a - 3$
Find $(g \cdot h)(-4)$

7) $g(t) = t^2 + 3$
 $h(t) = 4t - 3$
Find $(g \cdot h)(-1)$

8) $g(n) = 3n + 2$
 $f(n) = 2n^2 + 5$
Find $g(f(2))$

9) $g(x) = -x^2 - 1 - 2x$
 $f(x) = x + 5$
Find $(g - f)(x)$

10) $f(x) = 3x - 1$
 $g(x) = x^2 - x$
Find $\left(\frac{f}{g}\right)(x)$

11) $g(a) = -3a - 3$
 $f(a) = a^2 + 5$
Find $(g - f)(a)$

12) $h(t) = 2t + 1$
 $g(t) = 2t + 2$
Find $(h - g)(t)$

13) $f(x) = 2x^3 - 5x^2$
 $g(x) = 2x - 1$
 Find $(f \cdot g)(x)$

14) $h(n) = 4n + 5$
 $g(n) = 3n + 4$
 Find $(h - g)(n)$

15) $g(a) = -3a^2 - a$
 $h(a) = -2a - 4$
 Find $\left(\frac{g}{h}\right)(a)$

16) $f(n) = 2n$
 $g(n) = -n - 4$
 Find $(f \circ g)(n)$

17) $h(a) = 3a$
 $g(a) = -a^3 - 3$
 Find $\left(\frac{h}{g}\right)(a)$

18) $g(n) = 2n + 3$
 $h(n) = n - 1$
 Find $(g \circ h)(n)$

19) $h(x) = x^2 - 2$
 $g(x) = 4x + 1$
 Find $(h \circ g)(x)$

20) $g(t) = 2t + 5$
 $f(t) = -t^2 + 5$
 Find $(g + f)(t)$

21) $g(x) = 2x - 2$
 $f(x) = x^2 + 3x$
 Find $(g \circ f)(-2 + x)$

22) $g(a) = 2a + 2$
 $h(a) = -2a - 5$
 Find $(g \circ h)(-4 + a)$

Evaluate each expression. Remember to use the appropriate reference angle and proper sign according to the quadrant.

1. $\frac{1 - \sin 60^\circ}{\cos 60^\circ} =$

2. $\cos^2 30^\circ + \sin^2 30^\circ =$

3. $\csc^2 45^\circ - \cot^2 45^\circ =$

4. $\cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ =$

Prove that each of the following expressions is an identity.

5. $\frac{\csc^2 \theta}{1 + \sec^2 \theta} = \frac{\cot^2 \theta}{\cos^2 \theta + 1}$

$$6. \frac{\tan \theta}{\cot \theta - \csc \theta} = \frac{-1 - \cos \theta}{\cos \theta}$$

$$7. \frac{\sec^2 \theta - 1}{\sec^2 \theta} = \sin^2 \theta$$

Hint for #7: See example 1 in lesson 9 in the instruction manual for an identity for $\sec^2 \theta$, and try using it in the numerator only.

$$8. \frac{1}{\cos \theta \sin \theta} + \frac{1}{\cos \theta \sin \theta} = 2 \csc \theta \sec \theta$$

$$9. \text{ Find the cos and tan for } \sin \theta = \frac{\sqrt{3}}{2}, \text{ and sketch the triangle.}$$

$$10. \text{ Find the measures of the two angles in number 9.}$$