

AB Calculus – Ch. P.4 Miscellaneous Practice problems (Day 4)

1)

For the piecewise function $p(x) = \begin{cases} \sqrt{x+4}, & x \leq 5 \\ (x-5)^2, & x > 5 \end{cases}$ find each of the following:

a) $p(-3)$

b) $p(0)$

c) $p(5)$

d) $p(10)$

2) Simplify the following given that all angles are between 0 and π :

a) $\sin\left(2 \arccos \frac{\sqrt{2}}{2}\right)$

b) $\cos\left(\arccos 0 + \arcsin \frac{1}{2}\right)$

3) Rewrite each of the following as an algebraic expression with no trig functions involved. (Hint: draw triangles and use Pythagorean Theorem.)

a) $\sin(\arccos 2x)$

b) $\cot(\arcsin x)$

c) $\sin(\arctan 3x)$

4) Solve the following (use identities where necessary) given that $0 \leq x < 2\pi$

a) $\cos^2 x - \cos x + 1 = \sin^2 x$

b) $\sin x \tan x = \sin x$

c) $\sin x = \cos 2x - 1$

$$d) \sin 4x = \frac{1}{2}$$

$$e) \cot^2 x - \csc x = 1$$

$$f) \sec^2 x + 2 \sec x = 0$$

$$g) \sin x = \cos x$$

$$h) \sin 2x = \cos x$$

$$i) \cot x \cos^2 x = 2 \cot x$$

5) Write the equation of each line in point-slope form:

a. given a point and the slope: $(1, -2)$ $m = 3$

b. given two points: $(1, -3)$ $(-7, 1)$

c. given the point $(-1, -2)$ and is perpendicular to the line $y - 2 = 3(x + 1)$.

d. given the point $(-1, -2)$ and is parallel to the line $3x + 2y = 1$.

6) Find the equation of the line in slope-intercept form, passing through the following points.

- a. $(-3,6)$ and $(-1,2)$ b. $(-7,1)$ and $(3,-4)$ c. $\left(-2, \frac{2}{3}\right)$ and $\left(\frac{1}{2}, 1\right)$

7)

Write equations of the line through the given point a) parallel and b) normal to the given line.

- a. $(5,-3)$, $x+y=4$ b. $(-6,2)$, $5x+2y=7$ c. $(-3,-4)$, $y=-2$

8)

Find an equation of the line containing $(4,-2)$ and parallel to the line containing $(-1,4)$ and $(2,3)$. Put your answer in general form.

9)

Find k if the lines $3x - 5y = 9$ and $2x + ky = 11$ are a) parallel and b) perpendicular.

10)

Condense and write as a single logarithm.

a. $\log_4 3 + 5\log_4 x$

b. $\log 3 - 5\log x$

c. $\ln 2 + 4\ln x - 3\ln y - \ln 8$

d. $2\ln 4 - \frac{1}{2}\ln x + \ln y - 3\ln 2$

11)

Expand each logarithmic expression.

a. $\log_7 \frac{5x}{y^4}$

b. $\log \frac{x^3}{9y^2}$

c. $\ln 27 \sqrt[4]{a}$

d. $\ln \frac{3x^2 + 1}{2x^3 - 3x^2}$