

MATH-9 TEST 2 (Unit 2 - Algebra and Trig. Review)

FALL 2004

100 points

NAME: _____

You may use scratch paper for calculations, but all your solutions must be on this test paper. You do not turn in the scratch paper. No credit will be given for solutions if work is not shown (except on the first five problems where it is not necessary to show work). No calculators.

Fill in the blanks. (2 points each)

(1) If $\cos\theta > 0$ and $\sin\theta < 0$ then θ is in quadrant _____

(2) $2 \sin(3x)\cos(3x) =$ _____

(3) $\left(\frac{4x^6y^2}{9x^2y^{-8}}\right)^{-1/2} =$ _____

(4) The solution to the inequality $|x| \leq 5$ is _____.

(5) $\cos^2(\pi/3) + \sin^2(\pi/3) =$ _____

(6) Factor completely: $(x+1)^{\frac{7}{2}} - (x+1)^{\frac{3}{2}}$ (3 points)

(7) SOLVE: $\sqrt{4x+1} + 1 = x$

(6 points)

(8) Find the following values. (2 points each)

a) $\sin(2\pi/3) =$ _____

b) $\cos(-\pi/4) =$ _____

c) $\tan(4\pi/3) =$ _____

d) $\cos(\pi) =$ _____

e) $\cot(\pi) =$ _____

f) $\sin(-7\pi/6) =$ _____

(9) Solve. Express your answer using INTERVAL notation

(7 points)

$$\frac{x}{x^2 - 4} \leq 0$$

(10) Solve. $x^{-1/2} - 5x^{1/2} + 4x^{3/2} = 0$ (7 points)

(11) If $\sin\theta = -3/7$ with $\tan\theta < 0$, then (3 points each)

a) $\cos\theta =$ _____

b) $\tan\theta =$ _____

(12) If $\tan\theta = 4/3$ with $\pi < \theta < 3\pi/2$, then (3 points each)

a) $\sin 2\theta =$ _____

b) $\cos(\theta/2) =$ _____

(13) A man flying a kite holds the end of the kite string at ground level and lets out 230 feet of string. If the angle of elevation of the kite is 30° , how high above the ground is the kite. (Simplify answer if possible) (5 points)

(14) Simplify:
$$\frac{(7 - 3x)^{1/2} + \frac{3}{2}x(7 - 3x)^{-1/2}}{7 - 3x}$$
 (5 points)

(15) Prove the identity.

(5 points)

$$\frac{2 \cot x}{\csc^2 x - 2} = \frac{2 \tan x}{1 - \tan^2 x}$$

(16) Find all solutions.

(a) $3 \sin x = 2 \cos^2 x$

(7 points each)

(b) $\cos 3x \tan x + \cos 3x - \tan x - 1 = 0$

(17) Find all solutions in $[0, 2\pi)$

(a) $\sin 2x - \sqrt{3} \cos x = 0$

(7 points each)

(b) $\sin^2 2x - 1 = 0$

Math 9 Sample Test 2 Answers

(1) IV (2) $\sin(6x)$ (3) $\frac{3}{2x^2y^5}$ (4) $[-5,5]$ (5) 1

(6) $(x+1)^{3/2}(x+2)x$ (7) $x=6$ (8) a) $\sqrt{3}/2$ b) $\sqrt{2}/2$ c) $\sqrt{3}$ d) -1 e) undefined f) $1/2$

(9) $(-\infty, -2) \cup [0, 2)$ $(-\infty, -2] \cup [0, 2)$ (10) $x = 1/4, 1$ (11) a) $2\sqrt{10}/7$ b) $-3/2\sqrt{10}$ (12) a) $24/25$ b) $-1/\sqrt{5}$

(13) 115 ft. (14) $\frac{14-3x}{2(7-3x)^{3/2}}$ (15) in class (16) (a) $x = \pi/6 + 2\pi k, 5\pi/6 + 2\pi k$ (b)

$x = 2\pi k/3, 3\pi/4 + \pi k$

(17) $x = \pi/2, 3\pi/2, \pi/3, 2\pi/3$ (b) $x = \pi/4, 3\pi/4, 5\pi/4, 7\pi/4$