

MATH 253 WORKSHEET WEEK 2

This does **not** count for marks.

1. The inverse function of $f(x) = (x + 3)^2 - 1$:

a $f^{-1}(x) = \sqrt{x+1} - 3$.

b Does not uniquely exist.

c $f^{-1}(x) = -\sqrt{x+1} - 3$.

d $f^{-1}(x) = \pm\sqrt{x+1} - 3$.

e It exists, but cannot be found easily.

2. The roots of $\log(2x - 1) - \log(3x) = 2$ are:

a 1,3.

b $-\frac{1}{298}$.

c No real solution exists.

d $\frac{1}{298}$.

e -1, -3.

3. The solution to $e^{-3\ln(x)} = 64$ is:

a No real solution exists.

b 4.

c -2.

d $\frac{1}{2}$.

e $\frac{1}{4}$.

4. Assuming that the inverse function of $f(x) = \frac{x}{1+3x}$, $x > -\frac{1}{3}$ exists, what is $f^{-1}(\frac{1}{2})$:

a -1.

b ∞ .

c $-\infty$.

d $\frac{2}{5}$.

e 0.

5. $\arcsin(\sin(-\frac{13\pi}{6}))$:

a $\frac{\pi}{6}$.

b $-\frac{\pi}{6}$.

c $-\frac{13\pi}{6}$.

d $\frac{13\pi}{6}$.

e Does not exist.

6. $\arccos(\cos(-\frac{11\pi}{6}))$:

a $\frac{5\pi}{6}$.

b $\frac{11\pi}{6}$.

c $-\frac{5\pi}{6}$.

d $-\frac{11\pi}{6}$.

e $\frac{\pi}{6}$.

7. Find a simplified value of $\cos(\arcsin(x^2))$, $|x| \leq 1$.

8. Find a simplified value of $\tan(\arcsin(x))$, $|x| < 1$.

9. Find the derivative of $f(x) = \arctan(x^x) + e^{\arcsin(2x)}$.

10. Find the derivative of $f(x) = \frac{x^7 \sin^3(x)}{(x-2)^5 \sqrt{\arctan(2x)}}$.

11. Find $\int \frac{\cos(x)}{3 \sin(x) - 2} dx$.

12. Find $\int \frac{e^x}{2e^x + 1} dx$.