

[16] 1. Find the exact values of

a) $\sin \frac{11\pi}{6}$

b) $\sec \frac{2\pi}{3}$

c) $\tan\left(\arcsin \frac{3}{4}\right)$

d) $\arcsin\left(\cos \frac{5\pi}{6}\right)$

[12] 2. Find the range of

a) $y = \arctan x$

b) $y = 3 - 2 \sin x$

c) $y = 3 \cos x$

[12]3. Suppose $\tan \theta = \frac{2x}{3}$ for some acute angle θ . Express in terms of x .

a) $\cos \theta$

b) $\sin 2\theta$

c) $\sin \theta$

[15]4. Solve each equation on the interval $0 \leq \theta < 2\pi$.

a) $\cos \theta = \frac{\sqrt{3}}{2}$

b) $2 \sin^2 \theta - \sin \theta = 0$

c) $\cos 3\theta = 1$

[10]5. Solve the following equations.

a) $x^2 + 5x = 14$

b) $\ln(x + 2) + \ln(x - 2) = \ln(3x)$

[14]6. Graph each function over one **complete period**.

Clearly label each graph pointing out **x -intercepts** and **maximum** and **minimum** points.

a) $y = -2 \sin x$

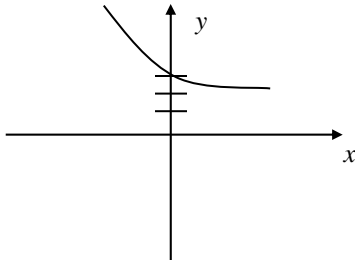


b) $y = \cos\left(x - \frac{\pi}{6}\right)$



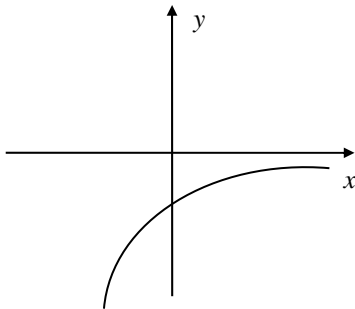
[16] 7. Match each graph with an appropriate equation. (Not all equations will match with a graph.)

1)



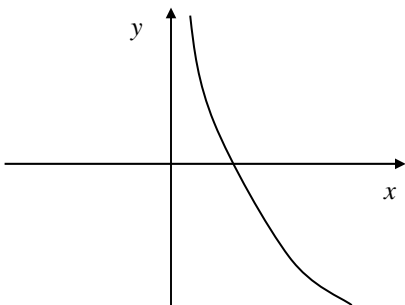
1 goes with _____

2)



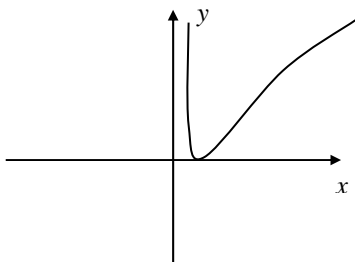
2 goes with _____

3)



3 goes with _____

4)



4 goes with _____

a) $y = \arcsin x$

b) $y = \tan^{-1} x$

c) $y = \csc x$

d) $y = |\cos x|$

e) $y = -e^x$

f) $y = -\ln x$

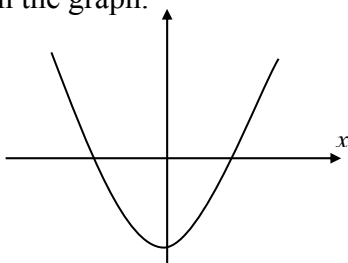
g) $y = 2 + e^{-x}$

h) $y = |\ln x|$

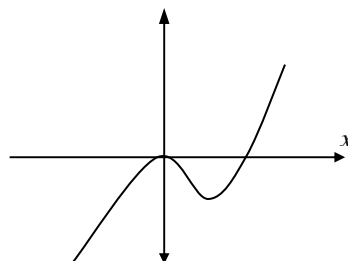
i) $y = \ln|x|$

b) Match the graph.

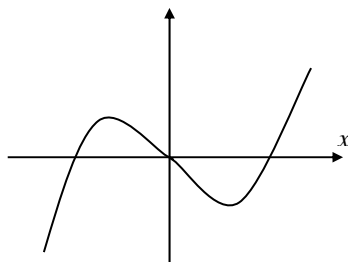
_____ A.



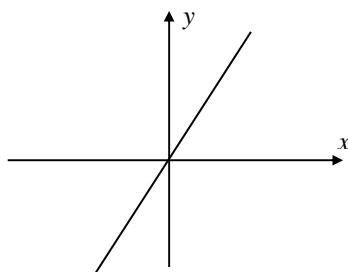
_____ B.



_____ C.



_____ D.



1. $y = x^3 - x^2$

2. $y = x^3 - 6x^2 + 11x - 6$

3. $y = x^3 - x$

4. $y = x^3 + 6x^2 + 11x + 6$

5. $y = -x^3 + x^2$

6. $y = x^4 - 1$

7. $y = x$

[10] 8. Establish the identity: ***Choose any two.***

a) $\tan^3 \theta = \sec^2 \theta \tan \theta - \tan \theta$

b) $\cos^4 \theta = \frac{3}{8} + \frac{1}{2} \cos 2\theta + \frac{1}{8} \cos 4\theta$

c) $\frac{1}{\sqrt{1 + \sin x}} = \frac{\sqrt{1 - \sin x}}{\cos x}$

[8] 9. Decompose into partial fractions and determine the coefficients.

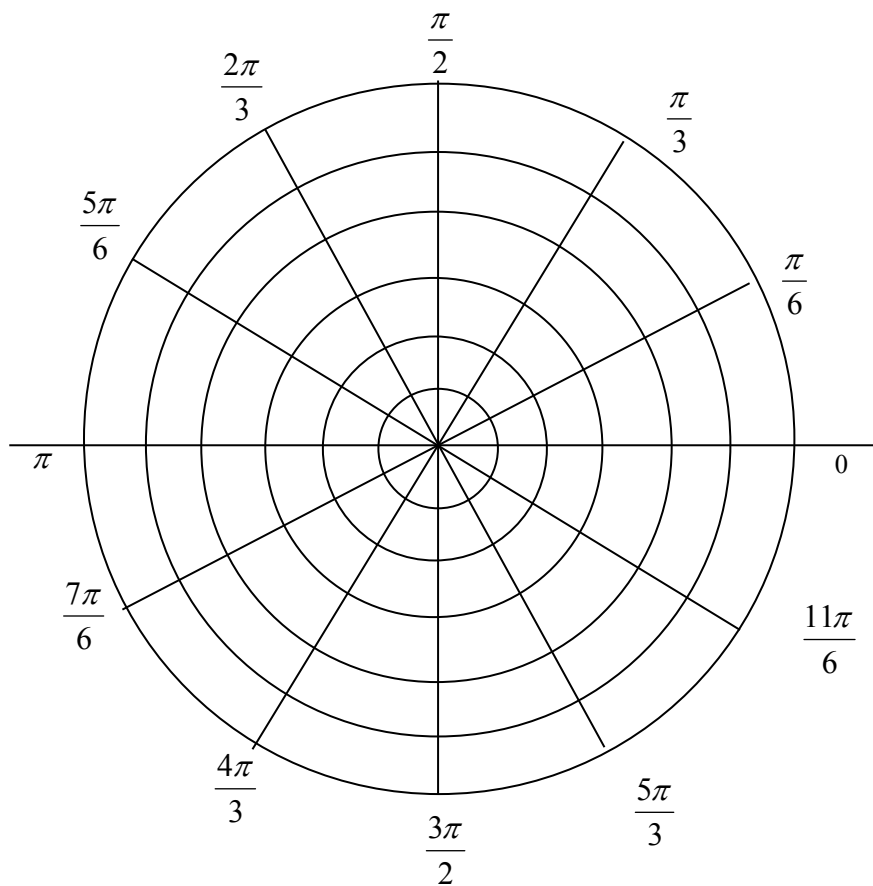
a) $\frac{4}{x^2 + 3x + 4}$

b) $\frac{x + 2}{x^2 - 2x - 24}$

[14] 10. Consider $r = 1 + \cos \theta$ and $r = 3 \cos \theta$.

a) Find all points of intersection. Only an algebraic solution will receive full credit.

b) Graph $r = 1 + \cos \theta$ and $r = 3 \cos \theta$ on the same graph. Label points of **intersection**.



[8] 11. Solve the following inequalities.

a) $x^2 + 3x \leq 28$

b) $\frac{x}{1+x} < \frac{x+2}{x-1}$

[20] 12. Compute the value of each of the following limits. In the case that the limit is not a finite number, determine whether it is $+\infty$ or $-\infty$.

a) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x^2 - 5x + 6}$

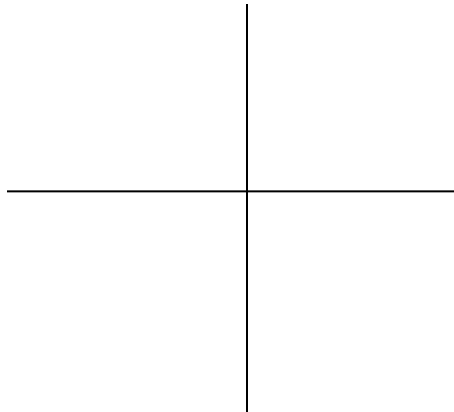
b) $\lim_{x \rightarrow \infty} \frac{3x^2 + 2x + 1}{4x^2 + x + 6}$

c) $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ where $f(x) = x^2 + 2x - 1$

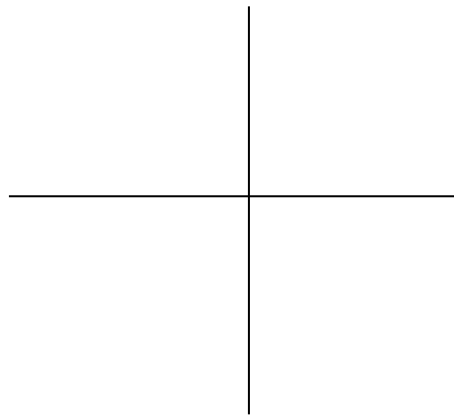
d) $\lim_{x \rightarrow 1} \frac{2-x}{x-1}$

[15] 13. Graph. (You must label at least 3 points and any asymptotes, if applicable.)

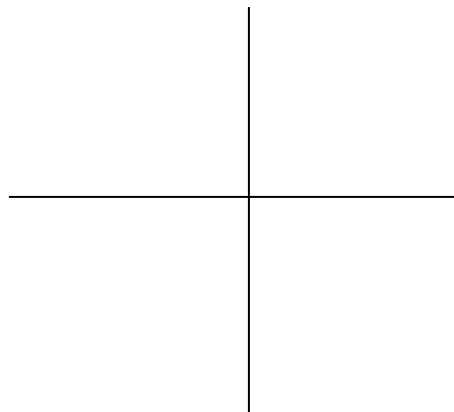
a) $y = 2 + (x + 1)^2$



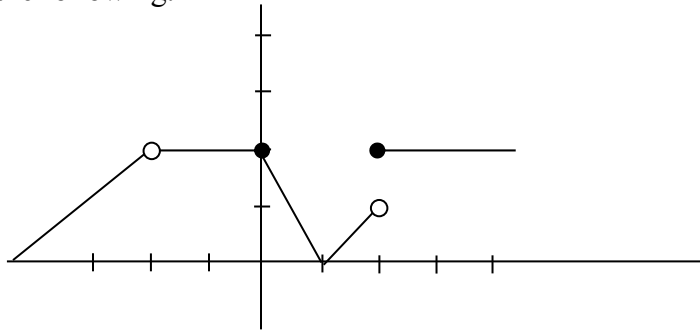
b) $y = (x + 1)(x - 2)^2$



c) $y = \ln(x + 2)$



[15]14. Evaluate the following.



a) $\lim_{x \rightarrow 2^+} f(x)$

b) $\lim_{x \rightarrow 2^-} f(x)$

c) $\lim_{x \rightarrow 2} f(x)$

d) $\lim_{x \rightarrow -2} f(x)$

e) $\lim_{x \rightarrow 0} f(x)$

[6] 15. Find the domain of the following functions.

a) $y = \frac{x+2}{x^2-4}$

b) $y = \sqrt{16-x^2}$

[9] 16. Given that $f(x) = x^3 + 2x^3 - x - 2$.

a) Using the synthetic division find $f(-1)$.

b) Factorize $f(x)$ completely.