MAT 126 Fall 2020, Quiz 9

Name	ID	Section

THIS QUIZ IS WORTH 10 POINTS.
NO BOOKS, NOTES OR CALCULATORS ARE ALLOWED.

Write the correct answer in the box.

Write C if the improper integral converges or a D if it diverges (is infinite or undefined).

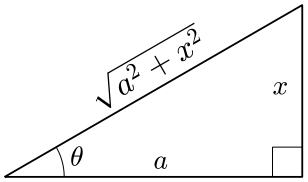
(1) ☐ $\int_1^\infty \frac{1}{x}dx$

(2) ☐ $\int_0^\infty \frac{x^3}{e^x}dx$

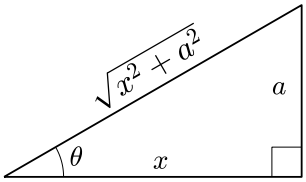
(3) ☐ $\int_0^\infty \frac{x^5+x^3+1}{x^6+x^4+x^2+1}dx$

(4) ☐ $\int_1^\infty \frac{\cos^2(x)}{x^2}dx$

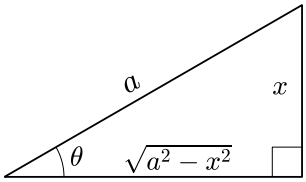
(5) ☐ Which reference triangle corresponds to $\cos\theta = \frac{x}{a}$?



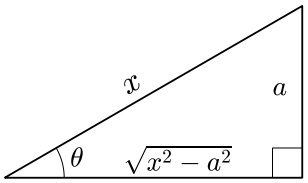
A



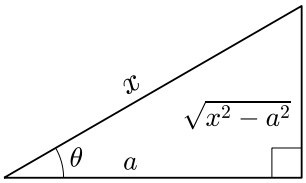
B



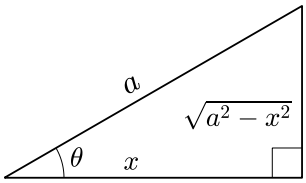
C



D



E



F

For each integral choose the appropriate substitution from the right.

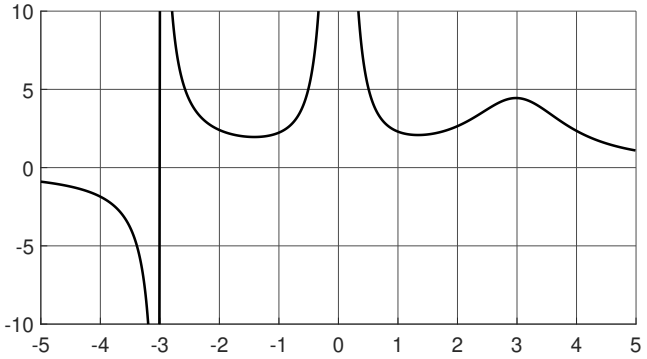
(6) ☐ $\int x^4\sqrt{x^2-9}dx$

(7) ☐ $\int x^4\sqrt{x^2+9}dx$

(a) $x = \tan\theta$
(b) $x = \sec\theta$
(c) $x = \sin\theta$
(d) $x = 2\tan\theta$
(e) $x = 2\sec\theta$
(f) $x = 2\sin\theta$
(g) $x = 3\tan\theta$
(h) $x = 3\sec\theta$
(i) $x = 3\sin\theta$
(j) $x = 4\tan\theta$
(k) $x = 4\sec\theta$
(l) $x = 4\sin\theta$

(8) ☐ Which choice is a possible partial fraction expansion for the graph below?

(a) $\frac{A}{x-4}+\frac{Bx+C}{(x+4)^2}+\frac{D}{1+(x+1)^2}$
(b) $\frac{A}{x+3}+\frac{Bx+C}{x^2}+\frac{D}{1+(x-3)^2}$
(c) $\frac{A}{x-2}+\frac{Bx+C}{(x+4)^2}+\frac{D}{1+(x+1)^2}$
(d) $\frac{A}{x+2}+\frac{Bx+C}{(x-1)^2}+\frac{D}{1+(x-4)^2}$
(e) $\frac{A}{x+4}+\frac{Bx+C}{(x-4)^2}+\frac{D}{1+(x+1)^2}$
(f) $\frac{A}{x+4}+\frac{Bx+C}{(x-3)^2}+\frac{D}{1+x^2}$
(g) $\frac{A}{x+5}+\frac{Bx+C}{(x+2)^2}+\frac{D}{1+(x-4)^2}$
(h) none of these



(9) ☐ If $\frac{x+9}{x^2-1}=\frac{A}{x-1}+\frac{B}{x+1}$, then

(a) $A=7, B=-4$
(b) $A=2, B=10$
(c) $A=5, B=-4$
(d) $A=7, B=4$
(e) $A=4, B=5$
(f) $A=-4, B=7$
(g) $A=2, B=-10$
(h) $A=-4, B=4$
(i) $A=4, B=7$
(j) $A=5, B=4$
(k) $A=-3, B=6$
(l) $A=7, B=-9$
(m) $A=-2, B=-4$
(n) $A=3, B=7$
(o) none of these

(10) ☐ Using long division of polynomials, $\frac{3x^3-3x^2+1}{x^2+2}=$

(e) $4x-2-\frac{5x-4}{x^2+1}$
(f) $3x+3-\frac{6x-5}{x^2+2}$
(g) $2x+2-\frac{2x+2}{x^2+1}$
(h) $4x+1+\frac{3x+1}{x^2+1}$
(e) $4x+2-\frac{5x+4}{x^2+1}$
(f) $3x-3-\frac{6x-7}{x^2+2}$
(g) $3x+2-\frac{2x+2}{x^2+1}$
(h) $4x+\frac{-3x+2}{x^2+1}$
(i) $2x+2-\frac{x-3}{x^2+1}$
(j) $x-3-\frac{5x+1}{x^2+2}$
(k) $3x-2-\frac{3x-2}{x^2+1}$
(l) none of these

Answers: 1D, 2C, 3D, 4C, 5F, 6H, 7G, 8B, 9C, 10F