

## Exam Review

Date \_\_\_\_\_ Period \_\_\_\_\_

**Solve each equation. Remember to check for extraneous solutions. Work must shown for full credit.**

1)  $\frac{1}{2x^2} + \frac{x+5}{x^2} = \frac{1}{2x}$

A)  $\{-5\}$       B)  $\{-11\}$

C)  $\{-3\}$       D)  $\{2\}$

2)  $\frac{2}{3k} = \frac{k+1}{3k} + \frac{1}{k}$

A)  $\{-5\}$       B)  $\{-3\}$

C)  $\{-1\}$       D)  $\{-2\}$

**Simplify each by factoring completely and reducing.**

3)  $\frac{5n^2 - 27n - 56}{20n - 16} \div \frac{30n^2 + 48n}{30n^2 - 24n}$

4)  $\frac{7k^2 - 38k + 40}{5k^2 - 13k - 6} \cdot \frac{45k + 18}{7k - 10}$

5)  $\frac{25p^2 + 35p}{p + 7} \cdot \frac{4p - 36}{25p^2 + 35p}$

6)  $\frac{8p^2 - 8p}{p - 2} \div \frac{18p^2 - 42p^3}{42p^3 - 18p^2}$

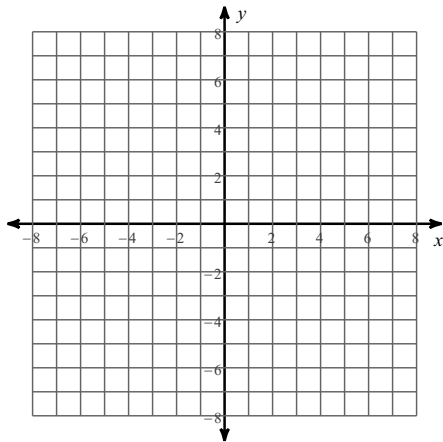
**Simplify each expression.**

$$7) \frac{7}{7n+1} - \frac{8n}{5n-7}$$

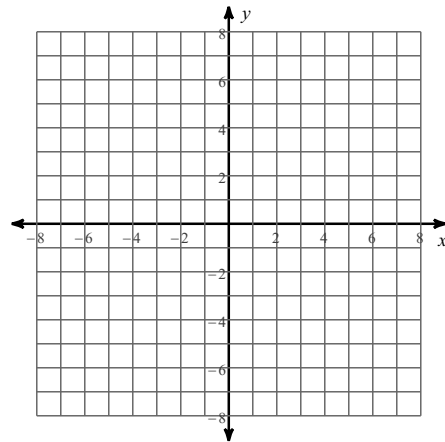
$$8) \frac{6k}{4k} + \frac{k+4}{5k-6}$$

**Factor each part and show table for end behavior, then graph each function.**

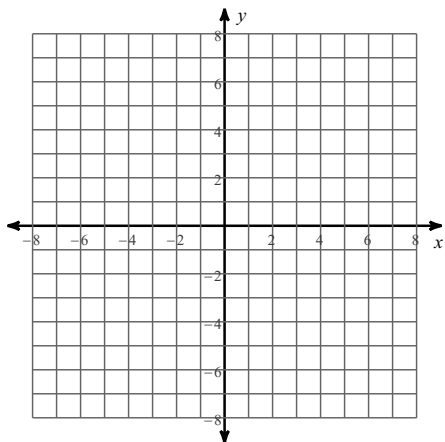
$$9) f(x) = \frac{3x-3}{x^2-4x+3}$$



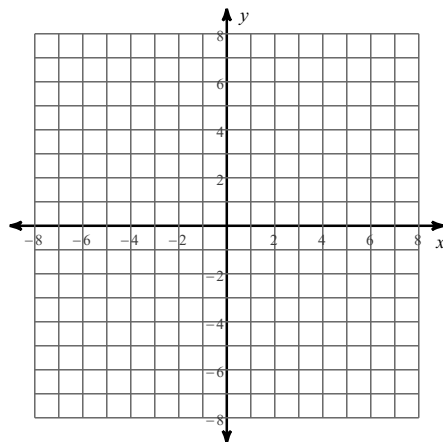
$$10) f(x) = \frac{-3x^2+3x}{x^2-9}$$



$$11) f(x) = \frac{-x^2 - 4x}{x^2 - x - 6}$$



$$12) f(x) = \frac{x}{-x^3 + x^2 + 6x}$$



Use a calculator to approximate each to the nearest thousandth using the change of base formula.

$$13) \log_3 60$$

- A) 5.028      B) 3.727  
C) 3.558      D) 2.002

$$14) \log_7 40$$

- A) 1.576      B) 2.066  
C) 1.896      D) 2.266

$$15) \log_4 40$$

- A) 2.661      B) 2.28  
C) 1.525      D) 2.792

$$16) \log_2 10$$

- A) 2.573      B) 2.992  
C) 3.151      D) 3.322

Condense each expression to a single logarithm.

$$17) \log_6 3 + \frac{\log_6 7}{2} + \frac{\log_6 8}{2}$$

- A)  $\log_6 (8^{24} \cdot 7^4)$   
B)  $\log_6 (8^4 \cdot 7^6)$   
C)  $\log_6 (8^{24} \cdot 7^4)$   
D)  $\log_6 (3 \sqrt[3]{56})$

$$18) \log_6 3 + \frac{\log_6 11}{2} + \frac{\log_6 2}{2}$$

- A)  $\log_6 (22 \cdot 3^2)$   
B)  $\log_6 (3^2 \sqrt{11})$   
C)  $\log_6 (2^6 \cdot 11^3)$   
D)  $\log_6 (3 \sqrt{22})$

19)  $15 \log_6 8 + 5 \log_6 3$

A)  $\log_6 (3^5 \cdot 8^{15})$

B)  $\log_6 \sqrt{168}$

C)  $\log_6 \frac{8^3}{3^5}$

D)  $\log_6 (3^5 \cdot 8^3)$

20)  $\log_8 x + \log_8 y + 4 \log_8 z$

A)  $\log_8 (z^4 \sqrt{x})$

B)  $\log_8 (y^5 x^{20})$

C)  $\log_8 (yxz^4)$

D)  $\log_8 (z \sqrt{yx})$

**Expand each logarithm.**

21)  $\log_6 (x \cdot y \cdot z^6)$

A)  $12 \log_6 x - 2 \log_6 y$

B)  $\log_6 x + \log_6 y + 6 \log_6 z$

C)  $\log_6 z + \frac{\log_6 x}{3} + \frac{\log_6 y}{3}$

D)  $2 \log_6 x - 12 \log_6 y$

22)  $\log_8 \left( \frac{12^6}{11} \right)^4$

A)  $6 \log_8 7 + \frac{\log_8 12}{3}$

B)  $24 \log_8 12 + 4 \log_8 11$

C)  $24 \log_8 12 - 4 \log_8 11$

D)  $6 \log_8 12 + 4 \log_8 11$

23)  $\log (a^2 b^2)$

A)  $2 \log a + 2 \log b$

B)  $4 \log a - 2 \log b$

C)  $4 \log a + 2 \log b$

D)  $2 \log c + \frac{\log a}{3}$

24)  $\log_8 \left( \frac{x^4}{y} \right)^5$

A)  $20 \log_8 x - 5 \log_8 y$

B)  $5 \log_8 x + 20 \log_8 y$

C)  $4 \log_8 x - 5 \log_8 y$

D)  $5 \log_8 x - 20 \log_8 y$

Solve each equation. Round your answers to the nearest ten-thousandth. Show work for full credit.

25)  $-9.7 \cdot 18^{3b} = -18$

- A) 0.0895      B) 0.0713  
C) 0.2061      D) 0.2192

26)  $8 \cdot 12^{k+9.1} = 38.1$

- A) No solution.      B) -7.5392  
C) -8.4719      D) -8.4222

27)  $16^{-r} - 1 = 40$

- A) -1.6128      B) -1.3394  
C) -3.7136      D) -3.6968

28)  $10^{5n} + 6 = 73.9$

- A) 0.8436      B) 0.6884  
C) 0.8815      D) 0.3664

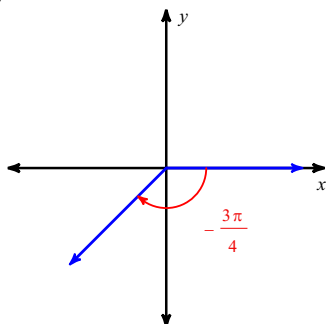
Convert each degree measure into radians showing work.

29)  $-225^\circ$

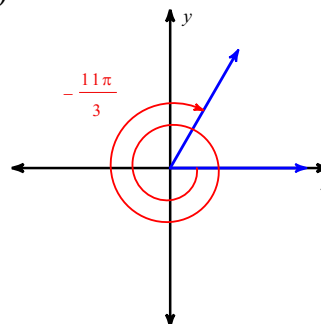
30)  $\frac{4\pi}{3}$

Label the terminal point coordinates and then find the exact value of each trigonometric function.

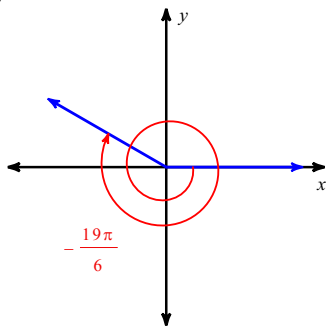
31)  $\csc \theta$



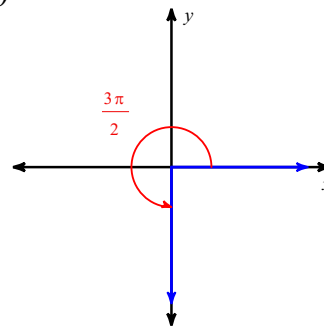
32)  $\cos \theta$



33)  $\sec \theta$



34)  $\csc \theta$



Graph each function using radians. Use attached graph paper.

35)  $y = 3 \sin 2\theta - 1$

36)  $y = 3 \cos \frac{\theta}{3} - 1$

37)  $y = 4 \cos \left( \frac{\theta}{4} - \frac{5\pi}{6} \right) + 2$

38)  $y = 1 + 4 \sin \left( 2\theta - \frac{5\pi}{6} \right)$

Solve each equation for  $0 \leq \theta < 2\pi$ . Show work for full credit.

39)  $-3 + \tan \theta = -4$

A)  $\left\{ \frac{3\pi}{4}, \frac{7\pi}{4} \right\}$

B)  $\left\{ \frac{3\pi}{4} \right\}$

C)  $\left\{ \frac{3\pi}{4}, \frac{4\pi}{3} \right\}$

D)  $\left\{ \frac{\pi}{3}, \frac{4\pi}{3}, \frac{7\pi}{4} \right\}$

40)  $\frac{8 - \sqrt{2}}{2} = 4 + \sin \theta$

A) No solution.

B)  $\left\{ \frac{\pi}{3}, \frac{5\pi}{4}, \frac{7\pi}{4} \right\}$

C)  $\left\{ \frac{2\pi}{3}, \frac{7\pi}{4} \right\}$

D)  $\left\{ \frac{5\pi}{4}, \frac{7\pi}{4} \right\}$

$$41) -5 + 2\sin \theta = -3$$

A) No solution.

B)  $\left\{ \frac{\pi}{2} \right\}$

C)  $\left\{ \frac{\pi}{2}, \frac{4\pi}{3}, \frac{5\pi}{3} \right\}$

D)  $\left\{ \frac{\pi}{2}, \frac{4\pi}{3} \right\}$

$$42) -3 - \frac{1}{3} \cdot \tan \theta = -\frac{10}{3}$$

A)  $\left\{ \frac{\pi}{3}, \frac{5\pi}{4} \right\}$

B)  $\left\{ \frac{\pi}{4} \right\}$

C)  $\left\{ \frac{\pi}{3}, \frac{4\pi}{3} \right\}$

D)  $\left\{ \frac{\pi}{4}, \frac{5\pi}{4} \right\}$

$$43) \frac{2 + \sqrt{2}}{2} = 1 + \sin \left( -3\theta + \frac{3\pi}{4} \right)$$

$$44) \frac{3 - \sqrt{3}}{3} = 1 - \tan \left( -3\theta + \frac{\pi}{4} \right)$$

# Answers to Exam Review

1) B

2) D

3)  $\frac{n-7}{4}; \left\{ \frac{4}{5}, 0, -\frac{8}{5} \right\}$

4)  $\frac{9(k-4)}{k-3}; \left\{ 3, -\frac{2}{5}, \frac{10}{7} \right\}$

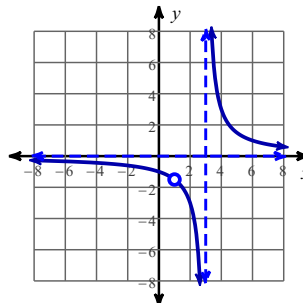
5)  $\frac{4(p-9)}{p+7}; \left\{ -7, 0, -\frac{7}{5} \right\}$

6)  $-\frac{8p(p-1)}{p-2}; \left\{ 2, 0, \frac{3}{7} \right\}$

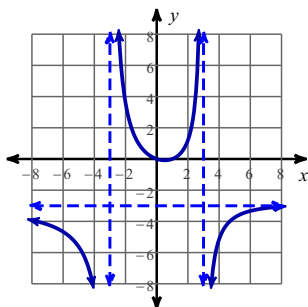
7)  $\frac{27n-49-56n^2}{(5n-7)(7n+1)}$

8)  $\frac{17k-10}{2(5k-6)}$

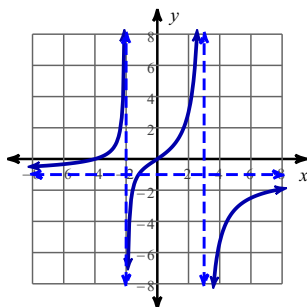
9)



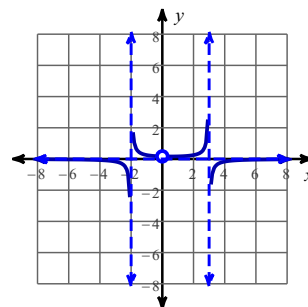
10)



11)



12)



13) B

14) C

15) A

16) D

17) D

18) D

19) A

20) C

21) B

22) C

23) A

24) A

25) B

26) C

27) B

28) D

29)  $-\frac{5\pi}{4}$

30)  $240^\circ$

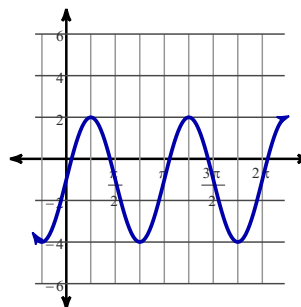
31)  $-\sqrt{2}$

32)  $\frac{1}{2}$

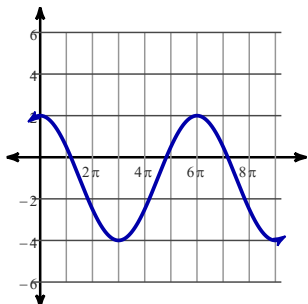
33)  $-\frac{2\sqrt{3}}{3}$

34)  $-1$

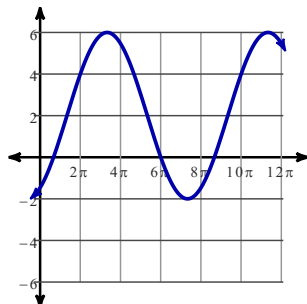
35)



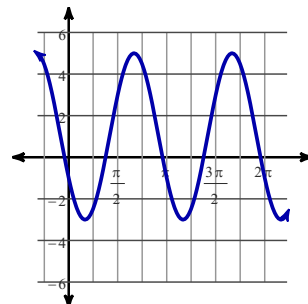
36)



37)



38)



39) A

40) D

41) B

42) D

43)  $\left\{ 0, \frac{\pi}{6}, \frac{2\pi}{3}, \frac{5\pi}{6}, \frac{4\pi}{3}, \frac{3\pi}{2} \right\}$

44)  $\left\{ \frac{\pi}{36}, \frac{13\pi}{36}, \frac{25\pi}{36}, \frac{37\pi}{36}, \frac{49\pi}{36}, \frac{61\pi}{36} \right\}$