SPRING 2017 MATH 0312 REVIEW EXAM 4 (Wednesdays)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find all numbers not in the domain of the function.

1) $f(x) = \frac{x - 8}{3 - x}$ 1) _____

A) -3 B) 3, 8 C) 3 D) None

Express the rational expression in lowest terms.

2) $\frac{y^2 - 2y - 8}{y^2 + 7y + 10}$ 2) _____

A) $\frac{-2y + 8}{7y - 7}$ B) $\frac{y - 4}{y + 5}$ C) $-\frac{y^2 - 2y - 8}{y^2 + 7y + 10}$ D) $\frac{-2y - 8}{7y + 10}$

Perform the indicated operation and express in lowest terms.

3) $\frac{z^2 + 9z + 18}{z^2 + 15z + 54} \div \frac{z^2 + 3z}{z^2 + 13z + 36}$ 3) _____

A) $z + 4$ B) $\frac{z + 4}{z^2 + 9z}$ C) $\frac{z + 4}{z}$ D) $\frac{z}{z^2 + 15z + 54}$

Add or subtract as indicated. Write the answer in lowest terms.

4) $\frac{2}{y^2 - 3y + 2} + \frac{7}{y^2 - 1}$ 4) _____

A) $\frac{12y - 9}{(y - 1)(y + 1)(y - 2)}$ B) $\frac{28y - 12}{(y - 1)(y + 1)(y - 2)}$

C) $\frac{9y - 12}{(y - 1)(y - 2)}$ D) $\frac{9y - 12}{(y - 1)(y + 1)(y - 2)}$

Simplify the complex fraction.

5) $\frac{\frac{1}{a} + 1}{\frac{1}{a} - 1}$ 5) _____

A) 1 B) $1 - a^2$ C) $\frac{a}{1 - a^2}$ D) $\frac{1 + a}{1 - a}$

Simplify the expression involving rational exponents.

6) $8^{4/3}$ 6) _____

A) 64 B) 32 C) 16 D) 128

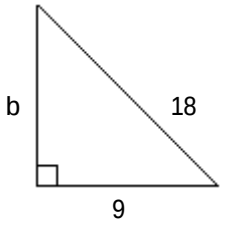
Express the radical in simplified form.

7) $\sqrt{98}$ 7) _____

A) $49\sqrt{2}$ B) 9 C) 7 D) $7\sqrt{2}$

Find the unknown length in the right triangle. Simplify the answer if necessary.

8) 8) _____



A) $9\sqrt{3}$ B) $3\sqrt{3}$ C) $3\sqrt{5}$ D) $9\sqrt{5}$

Simplify. Assume that all variables represent positive real numbers.

9) $\sqrt{2x} + 2\sqrt{32x} + 8\sqrt{72x}$ 9) _____

A) $57\sqrt{2x}$ B) $11\sqrt{106x}$ C) $10\sqrt{106x}$ D) $56\sqrt{2x}$

Rationalize the denominator. Assume that all variables represent positive real numbers and that the denominator is not zero.

10) $\dfrac{7x}{\sqrt{9 + x}}$ 10) _____

A) $\dfrac{7x}{9 + x}$ B) $7x$ C) $7x\sqrt{9 + x}$ D) $\dfrac{7x\sqrt{9 + x}}{9 + x}$

Rationalize the denominator. Assume that all variables represent positive real numbers.

11) $\dfrac{9}{\sqrt{2}}$ 11) _____

A) $\dfrac{81\sqrt{2}}{2}$ B) $9\sqrt{2}$ C) $\dfrac{9\sqrt{2}}{2}$ D) 13

Multiply, then simplify the product. Assume that all variables represent positive real numbers.

12) $(7 + \sqrt[3]{3})(7 - \sqrt[3]{3})$ 12) _____

A) 46 B) 40 C) $49 - \sqrt[3]{9}$ D) $49 - \sqrt[3]{3}$

Rationalize the denominator. Assume that all variables represent positive real numbers and that the denominator is not zero.

13) $\dfrac{4}{8 - \sqrt{3}}$ 13) _____

A) $\dfrac{32 + 4\sqrt{3}}{5}$ B) $\dfrac{32 + 4\sqrt{3}}{61}$ C) $\dfrac{4}{8} - \dfrac{4}{\sqrt{3}}$ D) $\dfrac{32 - 4\sqrt{3}}{61}$

Add or subtract as indicated. Write your answer in the form a + bi.

14) $(4 + 4i) - (-2 + i)$ 14) _____

A) $6 - 3i$ B) $2 + 5i$ C) $6 + 3i$ D) $-6 - 3i$

Write the expression in the form a + bi.

15) $\frac{4 + 3i}{5 + 2i}$ 15) _____

A) $\frac{26}{29} + \frac{7}{29}i$ B) $\frac{2}{3} - \frac{1}{3}i$ C) $\frac{14}{29} - \frac{23}{29}i$ D) $\frac{26}{21} - \frac{1}{3}i$

Use the quadratic formula to solve the equation. (All solutions are real numbers.)

16) $5n^2 = -10n - 2$ 16) _____

A) $\left\{\frac{-10 + \sqrt{15}}{5}, \frac{-10 - \sqrt{15}}{5}\right\}$ B) $\left\{\frac{-5 + \sqrt{15}}{10}, \frac{-5 - \sqrt{15}}{10}\right\}$

C) $\left\{\frac{-5 + \sqrt{35}}{5}, \frac{-5 - \sqrt{35}}{5}\right\}$ D) $\left\{\frac{-5 + \sqrt{15}}{5}, \frac{-5 - \sqrt{15}}{5}\right\}$