Math 3

REVIEW FOR NCFE Act. #88

1. What is the simplified form of $\frac{x^2-x-6}{x^2-5x+6}$?

A. $\frac{x-3}{x+3}$
B. $\frac{x-2}{x+2}$
C. $\frac{x+2}{x-2}$
D. $\frac{x+3}{x-3}$

Standard: A-APR.6

2. Which fraction is equivalent to $\frac{6x^2-5x-6}{9x+6} \div \frac{2x^2-3x-9}{x^2-3x}$ in lowest terms?

A. $\frac{(2x-3)(2x+3)}{3x}$
B. $\frac{x(2x-3)}{3(2x+3)}$
C. $\frac{2x-3}{2x+3}$
D. $\frac{x}{3}$

Standard: A-APR.7

3. Given the function $P(x)=x^3+4x^2+Kx+15$ for what value of K is $(x+3)$ a factor of $P(x)$?

A. -26
B. -8
C. 8
D. 26

Standard: A-APR.2

4. Given the function $f(x)=(x-2)(x+3)(2x+3)$, which set includes all of the zeros for the polynomial?

A. $\{-2, \frac{2}{3}, 3\}$
B. $\{-2, 1\frac{1}{2}, 3\}$
C. $\{-3, -\frac{2}{3}, 2\}$
D. $\{-3, -1\frac{1}{2}, 2\}$

Standard: A-APR.3

5. Which of the following numbers are solutions to the rational equation $\frac{x+5}{x-2} - \frac{5}{x+2} = \frac{28}{x^2-4}$?

A. -4 and 2
B. -4
C. -8 and 2
D. -8

Standard: A-REI.2

6. Which of the following equations is equivalent to $\frac{x+2}{2} = \frac{1}{x+1}$?

A. $2x+3=3$
B. $2(x+1)=x+2$
C. $2(x+2)=x+1$
D. $(x+2)(x+1)=2$

Standard: A-REI.2

7. Which expression is equivalent to $\ln\left(\frac{2}{x^2}\right)$ for $x>0$?

A. $\ln\left(\frac{1}{x}\right)$
B. $\ln(2) - 2\ln(x)$
C. $2(1-\ln(x))$
D. $\frac{\ln(2)}{2\ln(x)}$

Standard: A-SSE.2

8. Which equation is equivalent to the piecewise function shown below?

$$y=\begin{cases} -2x, & x \le 1 \\ 2x-4, & x>1 \end{cases}$$

A. $y=2|x-2|-1$
B. $y=2|x+1|-2$
C. $y=2|x-1|-2$
D. $y=2|x+2|-1$

Standard: A-SSE.2

(9) Let $f(x) = 2x - 1$ and $g(x) = -x^2 + x - 3$. Which equation shows $h(x)$, where $h(x) = f(x) \cdot g(x)$?

A. $h(x) = x^2 + x + 3$

B. $h(x) = -x^2 + 3x - 4$

C. $h(x) = -2x^3 + x^2 - 5x - 3$

D. $h(x) = -2x^3 + 3x^2 - 7x + 3$

Standard: F-BF.1

(10) **A water sprinkler rotates in a circular pattern with a radius of 8 feet. If the sprinkler stops 60° short of completing the circular pattern, what is the approximate area of the watered region?**

A. $33.49\ \text{ft}^2$

B. $41.87\ \text{ft}^2$

C. $167.47\ \text{ft}^2$

D. $200.96\ \text{ft}^2$

(11) For what value of x is it true that $e^{3x+5} = 28$?

A. $\log_3(28) - 5$

B. $\dfrac{\ln(28) - 5}{\ln(3)}$

C. $\dfrac{\ln(28)}{3} - 5$

D. $\dfrac{\ln(28) - 5}{3}$

(12) Which relation is the inverse of the function $f(x) = x^2 + 3$?

A. $g(x) = \pm\sqrt{x - 3}$

B. $g(x) = \pm\sqrt{x + 3}$

C. $g(x) = \pm\sqrt{x} - 3$

D. $g(x) = \pm\sqrt{x} + 3$

13

What is the ***approximate*** length of the arc subtended by an angle of $\frac{4\pi}{3}$ radians on a circle with a radius of 6.00 meters?

A. 12.57 meters

B. 14.14 meters

C. 25.13 meters

D. 28.27 meters

14 **The amount of money Sarah earns per week is modeled by the function W below where h represents the number of hours Sarah works in a week.**

$$W(h) = \begin{cases} 8h, & 0 < h \leq 40 \\ 12(h-40)+320, & h > 40 \end{cases}$$

If Sarah worked a total of 48 hours last week, how much money did she earn?

A. $384

B. $416

C. $576

D. $896

15 **Which equation has the same zero(s) as the function $f(x) = \frac{3x+15}{2x-8}$?**

A. $2x-8=0$

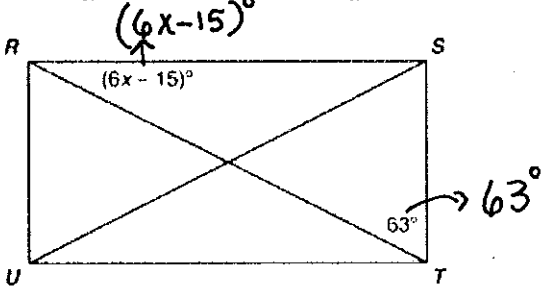
B. $3x+15=0$

C. $(3x+15)(2x-8)=0$

D. $(3x+15)-(2x-8)=0$

16

The diagram below shows rectangle $RSTU$ with two diagonals drawn.



To find the value of x, Justin wrote the following steps.

1. $m\angle STR + m\angle RTU = 90°$
2. $m\angle RTU = 27°$
3. $6x - 15 = 27$
4. $6x = 42$
5. $x = 7$

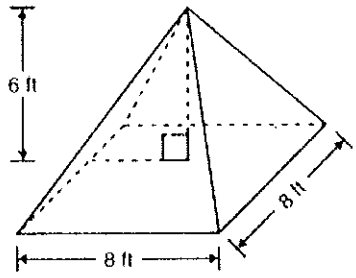
Which statement can be used to justify the first step?

A. The alternate interior angles formed by the diagonals are congruent.
B. The angles at each vertex of the rectangle are right angles.
C. Opposite angles in a rectangle are congruent.
D. The diagonals of a rectangle are congruent.

Standard: G-CO.14

17

A company makes square-pyramid-shaped tents with a height of 6 feet and a base with a side length of 8 feet, as shown below.



The company plans to make a new, larger tent by increasing the side length of the base by 2 feet. By how many cubic feet would this change increase the volume of the tent?

A. 216 cubic feet
B. 200 cubic feet
C. 72 cubic feet
D. 12 cubic feet

18 **A plane passes through the apex (top point) of a cone and then through its base. What geometric figure will be formed from this intersection?**

A. square
B. triangle
C. parabola
D. straight line

Standard: G-GMD.4 D

19 As part of a home-improvement project, Andy painted 10 walls in his house. The area of each wall is $142 ft^2$. The paint he bought comes in 2 gallon cans.

About how many cans did Andy need if 1 gallon of paint covers $150 ft^2$?

A. 5
B. 10
C. 11
D. 22

Standard: G-MG.1 D

20 Darren wants to determine the favorite sport of people living in his town. He knows that he needs a large sample size in order for the survey results to be representative of the residents of the town. Which sample should Darren use?

A. students in a tenth grade English class
B. people entering the local grocery store one weekend
C. people playing basketball at the local community center
D. people entering the local stadium to watch a baseball game

Standard: S-IC.3

21 **The owner of a nationwide chain of shopping malls is interested in the buying habits, on any given day, of the people who shop at the malls. Which sentence describes the BEST sample the owner could use to make inferences about the population?**

A. Choose one shopping mall from the chain and survey all the people who shop there every day of the week.
B. Choose one shopping mall from the chain and survey the managers of the three largest stores about the habits of the people who shop in their stores.
C. Randomly select a sample of shopping malls from the chain throughout the nation and survey a random sample of the people who shop at the mall on Friday.
D. Randomly select a sample of shopping malls from the chain throughout the nation and survey a random sample of the people who shop at the mall each day of the week.

22 Which characteristic in a statistical study is necessary in order for conclusions to be drawn regarding the whole population, based on the sample population?

A. The sample must be randomly selected.
B. The sample must not be randomly selected.
C. The population size must meet a minimum number requirement, based on the sample size.
D. The population size must meet a maximum number requirement, based on the sample size.