Honors Math 3 Cumulative Test Review

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Which two lines are parallel?
   I. $5y = -3x - 5$
   II. $5y = -1 - 3x$
   III. $3y - 2x = -1$

   (a) I and II b. I and III c. II and III d. No, two of the lines are parallel.

2. Are the lines $y = -x - 2$ and $4x + 4y = 16$ perpendicular? Explain.
   a. Yes; their slopes have product –1. (b) No; their slopes are not opposite reciprocals. c. Yes; their slopes are equal. d. No; their slopes are not equal

3. Give the slope-intercept form of the equation of the line that is perpendicular to $7x + 3y = 18$ and contains $P(6, 8)$.
   a. $y - 6 = \frac{3}{7}(x - 8)$ b. $y = \frac{3}{7}x + \frac{18}{7}$ (c.) $y = \frac{3}{7}x + \frac{38}{7}$ (d.) $y - 8 = \frac{3}{7}(x - 6)$

4. A sample of 40 employees of a company is selected, and the average age is found to be 40years.
   a. cluster b. convience (c.) statistic d. parmater

5. A group of 400 students were seperated into males vs females. Fifteen from each group was choosen. This represents what type of sampling.
   a. random b. cluster (c.) stratified d. systematic

6. You survey your volleyball team about their favorite type of ball. Is this biased or unbiased?
   (a.) biased b. unbiased

7. Use the empirical rule to solve the problem. The amount of Jen's monthly gas bill is normally distributed with a mean of $90 and a standard deviation of $5. What percentage of her phone bills are between $80 and $95?
   a. 65% b. 95% c. 99.7% (d.) 81.5%

8. If your sample size is 600 and you wish to cut the margin of error in half, what will your new sample size be?
   a. 2000 b. 1200 (c.) 2400 d. 300

Write a system of inequalities for the graph.

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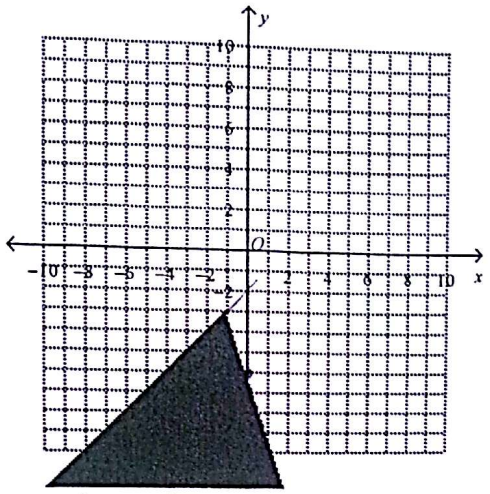
9.



$y \leq x - 2$

$y \leq \frac{-3}{1}x - 6$

a. $y \geq x - 2$
$y \geq -3x - 6$

b. $y \leq x + 3$
$y \geq 2x - 6$

c. $y \leq x - 2$
$y \leq -3x - 6$

d. $y \geq x + 3$
$y \leq 2x - 6$

Short Answer

Simplify the difference.

10. $(4w^2 - 4w - 8) - (2w^2 + 3w - 6)$ $2w^2 - 7w - 2$

Simplify the product.

11. $3p^4(4p^4 + 7p^3 + 4p + 1)$ $12p^8 + 21p^7 + 12p^5 + 3p^4$

12. $7a^3(5a^6 - 2b^3)$ $35a^9 - 14a^3b^3$

Solve the equation by completing the square. Round to the nearest hundredth if necessary.

13. $x^2 + 3x - 5 = 0$ $\left(x^2 + 3x + \left(\frac{3}{2}\right)^2\right) = 5 + \left(\frac{3}{2}\right)$ $\left(x + \frac{3}{2}\right)^2 = \frac{29}{4}$ $x = \frac{\sqrt{29}}{2} - \frac{3}{2}$ $x = -\frac{\sqrt{29}}{2} - \frac{3}{2}$ $x = \frac{-3 \pm \sqrt{29}}{2}$

Use the quadratic formula to solve the equation. If necessary, round to the nearest hundredth.

14. $2a^2 - 46a + 252 = 0$ $x = \frac{-(-46) \pm \sqrt{(-46)^2 - 4(2)(252)}}{4} = \frac{46 + \sqrt{100}}{4} = \frac{56}{4}$ or $\frac{36}{4}$

$x = 14$, $x = 9$

Find the number of real number solutions for the equation.

15. $x^2 + 0x - 1 = 0$ $b^2 - 4ac$ $0 - 4(1)(-1) = 4$ ~~one~~ two

16. $x^2 - 18 = 0$ $0 - 4(1)(-18) = 72$ two

Simplify the rational expression.

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17. $\frac{4x - 8}{4x + 20}$

18. $\frac{-9x}{x - x^2}$

Multiply.

19. $\frac{x^2 - 16}{6x} \cdot \frac{7x}{x + 4}$

20. $\frac{y^2 - 9}{-2y} \cdot \frac{-5y}{y + 3}$

Divide.

21. $(-10m^9 - 4m^8 - 12m^6) \div 2m^4$

$-5m^5 - 2m^4 - 6m^2$

$2m^4 \overline{)-10m^9 - 4m^8 - 12m^6}$

22. $(6x^2 - 13x + 2) \div (3x - 2)$

$2x - 3$

$3x - 2 \overline{)6x^2 - 13x + 2}$

$-6x^2 \pm 4x$

$-9x + 2$

$\pm 9x + 6$

-4

$2x - 3 + \frac{-4}{3x - 2}$

Simplify the expression.

23. $(-6i)(-6i)$ -36

24. $(2 + 5i)(-1 + 5i)$ $-2 - 5i + 10i + 25$

$23 + 5i$

Solve the equation.

25. $\sqrt{x + 10} - 7 = -5$

26. $4(3 - x)^{\frac{4}{3}} - 5 = 59$

Use the Quadratic Formula to solve the equation.

27. $4x^2 - x + 3 = 0$ $\frac{-(-1) \pm \sqrt{(-1)^2 - 4(4)(3)}}{2(4} = \frac{1 \pm \sqrt{-47}}{8} = \frac{1 \pm i\sqrt{47}}{8}$

28. $-2x^2 + x + 8 = 0$ $\frac{(-1) + \sqrt{(1)^2 - 4(-2)(8)}}{2(-2} = \frac{1 \pm \sqrt{65}}{-4} = \frac{-1 \pm \sqrt{65}}{4}$

Divide using synthetic division.

29. $(x^3 + 4 - 11x + 3x^2) \div (6 + x)$

$x^3 + 3x^2 - 11x + 4$

$-6 \mid 1 \quad +3 \quad -11 \quad 4$

$\quad\quad -6 \quad 18 \quad -42$

$1 \quad -3 \quad 7 \quad -38$

$x^2 - 3x + 7 +$

Find any points of discontinuity for the rational function.

30. $y = \frac{x - 8}{x^2 + 6x - 7}$

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Simplify the rational expression. State any restrictions on the variable.

31. $\dfrac{q^2 + 11q + 24}{q^2 - 5q - 24}$

32. $\dfrac{n^4 - 11n^2 + 30}{n^4 - 7n^2 + 10}$

Multiply or divide. State any restrictions on the variables.

33. $\dfrac{x+2}{x-1} \div \dfrac{x+4}{x^2 + 4x - 5}$

Add or subtract. Simplify if possible.

34. $\dfrac{b^2 - 2b - 8}{b^2 + b - 2} - \dfrac{6}{b-1}$

35. $\dfrac{d^2 - 9d + 20}{d^2 - 3d - 10} + \dfrac{d^2 - 2d - 8}{d^2 + 4d - 32}$

Simplify the complex fraction.

36. $\dfrac{\dfrac{4}{x+3}}{\dfrac{1}{x} + 3}$

Solve the equation. Check the solution.

37. $\dfrac{a}{a^2 - 36} + \dfrac{2}{a-6} = \dfrac{1}{a+6}$

38. The width of a rectangle is 33 centimeters. The perimeter is at least 776 centimeters.
a. Write and solve an inequality to find the length of the rectangle.
b. Write an inequality to find the area of the rectangle in square centimeters.

x
Per ≤ 776 | 33
$2x + 2(33) \leq 776$
$x \leq 355$
$A \leq 11715\ cm^2$

39. Write the polynomial in standard form.
$4g - g^3 + 3g^2 - 2$ $-g^3 + 3g^2 + 4g - 2$

40. Match the expression with its name.
$6x^3 - 9x + 3$ Cubic Trinomial

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Identify

41. Simplify the sum.

$(4u^3 + 4u^2 + 2) + (6u^3 - 2u + 8)$

$10u^3 + 2u^2 + 10 \qquad 2(5u^3 + u^2 + 5)$

Add or subtract.

42. $\frac{2x+3}{x-4} - \frac{x-5}{x+2}$

Write the number in the form $a + bi$.

43. $\sqrt{-4} + 10 \qquad 10 + 2i$

44. Find the zeros of $f(x) = (x+3)^2(x-5)^6$ and state the multiplicity.

-3 mult 2 $\quad$ 5 mult 6

45. $(-2x+6)^{\frac{1}{5}} = (-8+10x)^{\frac{1}{5}}$

46. Describe the vertical asymptote(s) and hole(s) for the graph of $y = \frac{(x-5)(x-2)}{(x-2)(x+4)}$.

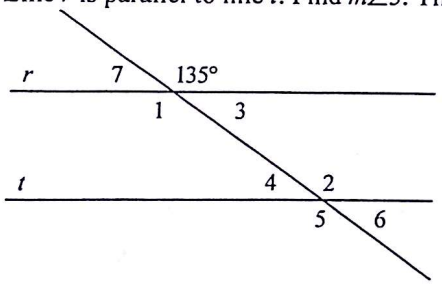
47. Write a recursive formula for the sequence 8, 10, 12, 14, 16, 18. Then find the next term.

$a_n = a_{n-1} + 2 \qquad a_1 = 8$

48. Write an explicit formula for the sequence $\frac{1}{2}, \frac{3}{7}, \frac{1}{3}, \frac{5}{19}, \frac{3}{14}, \ldots$. Then find a_{14}.

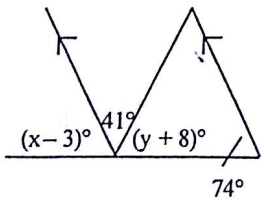
$a_n = \frac{1}{2} + -\frac{1}{14}(n-1) \qquad a_{14} = -\frac{3}{7}$

49. Line r is parallel to line t. Find $m\angle 5$. The diagram is not to scale.



$m\angle 5 = 135°$

50. Find the values of x and y. The diagram is not to scale.



$74 = x - 3 \qquad x = 77$

$77 + 41 + y + 8 = 180 \qquad y = 54$

51. Complete the statement. If a transversal intersects two parallel lines, then Same side interior or exterior ____ angles are supplementary.

52. Honors Math III Cumulative test scores had a mean of 92 and a standard deviation of 7. Find the z-score of a test score of 80.

$z = \frac{x - M}{\sigma} = \frac{80 - 92}{7} = -1.714$

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