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.

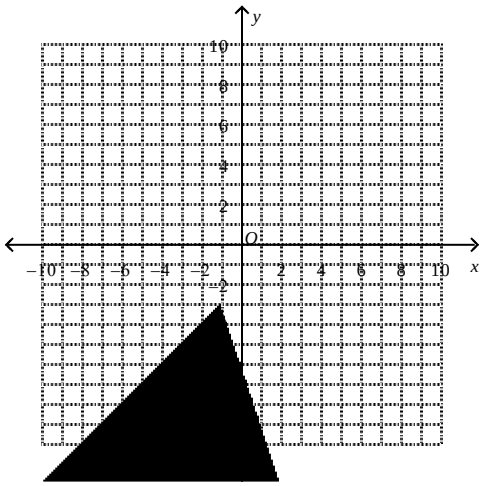
2. Are the lines $y = -x - 2$ and $4x + 4y = 16$ perpendicular? Explain.
   a. Yes; their slopes have product –1. b. No; their slopes are not opposite reciprocals. c. Yes; their slopes are equal. d. No; their slopes are not equal

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. $y - 8 = \frac{3}{7}(x - 6)$

Short Answer

Write a system of inequalities for the graph.

4.



Simplify the difference.

5. $(4w^2 - 4w - 8) - (2w^2 + 3w - 6)$

Simplify the product.

6. $3p^4(4p^4 + 7p^3 + 4p + 1)$

7. $7a^3(5a^6 - 2b^3)$

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

8. $x^2 + 3x - 5 = 0$

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

9. $2a^2 - 46a + 252 = 0$

Find the number of real number solutions for the equation.

10. $x^2 + 0x - 1 = 0$

11. $x^2 - 18 = 0$

Simplify the rational expression.

12. $\dfrac{4x - 8}{4x + 20}$

13. $\dfrac{-9x}{x - x^2}$

Multiply.

14. $\dfrac{x^2 - 16}{6x} \cdot \dfrac{7x}{x + 4}$

15. $\dfrac{y^2 - 9}{-2y} \cdot \dfrac{-5y}{y + 3}$

Divide.

16. $(-10m^9 - 4m^8 - 12m^6) \div 2m^4$

17. $(6x^2 - 13x + 2) \div (3x - 2)$

Simplify the expression.

18. $(-6i)(-6i)$

19. $(2 + 5i)(-1 + 5i)$

Solve the equation.

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

21. $4(3 - x)^{\frac{4}{3}} - 5 = 59$

Use the Quadratic Formula to solve the equation.

22. $4x^2 - x + 3 = 0$

23. $-2x^2 + x + 8 = 0$

Divide using synthetic division.

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

Find any points of discontinuity for the rational function.

25. $y = \dfrac{x - 8}{x^2 + 6x - 7}$

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

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

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

Multiply or divide. State any restrictions on the variables.

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

Add or subtract. Simplify if possible.

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

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

Simplify the complex fraction.

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

Solve the equation. Check the solution.

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

33. 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.

Add or subtract.

37. $\dfrac{2x+3}{x-4} - \dfrac{x-5}{x+2}$

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

38. $\sqrt{-4} + 10$

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

40. $(-2x+6)^{\frac{1}{5}} = (-8+10x)^{\frac{1}{5}}$

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

35. Match the expression with its name.
$6x^3 - 9x + 3$

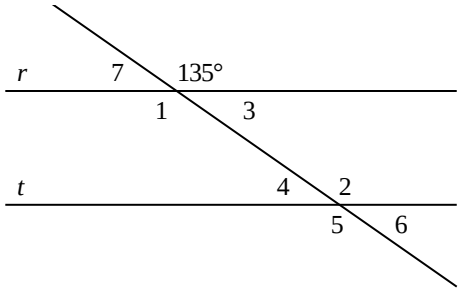
36. Simplify the sum.
$(4u^3 + 4u^2 + 2) + (6u^3 - 2u + 8)$

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

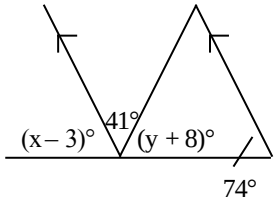
42. Write a recursive formula for the sequence 8, 10, 12, 14, 16, ... Then find the next term.

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

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



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



46. Complete the statement. If a transversal intersects two parallel lines, then ____ angles are supplementary.

Honors Math 3 Cumulative Test Review
Answer Section

MULTIPLE CHOICE

1. A
2. B
3. C

SHORT ANSWER

4. $y \leq x - 2$
   $y \leq -3x - 6$
5. $2w^2 - 7w - 2$
6. $12p^8 + 21p^7 + 12p^5 + 3p^4$
7. $35a^9 - 14a^3b^3$
8. 1.19, –4.19
9. 9, 14
10. 2
11. 2
12. $\frac{x - 2}{x + 5}$
13. $\frac{9}{x - 1}$
14. $\frac{7(x - 4)}{6}$
15. $\frac{-5(y - 3)}{-2}$
16. $-5m^5 - 2m^4 - 6m^2$
17. $2x - 3 - \frac{4}{3x - 2}$
18. –36
19. $-27 + 5i$
20. –6
21. –5, 11
22. $\frac{1}{8} \pm \frac{i\sqrt{47}}{8}$
23. $\frac{1}{4} \pm \frac{\sqrt{65}}{4}$
24. $x^2 - 3x + 7$, R –38
25. $x = 1, x = -7$
26. $\frac{q + 8}{q - 8}; q \neq -3, q \neq 8$

27. $\frac{n^2 - 6}{n^2 - 2}$; $n \neq \pm\sqrt{5}, n \neq \pm\sqrt{2}$
28. $\frac{(x + 2)(x + 5)}{x + 4}$, $x \neq 1, -4$
29. $\frac{b - 10}{b - 1}$
30. $\frac{2d^2 + 8d - 28}{(d + 2)(d + 8)}$
31. $\frac{4x}{3x^2 + 10x + 3}$
32. –9
33. $2(33) + 2\ell \geq 776$; $\ell \geq 355$; $A \geq 33(355)$
34. $-g^3 + 3g^2 + 4g - 2$
35. cubic trinomial
36. $10u^3 + 4u^2 - 2u + 10$
37. $\frac{x^2 + 16x - 14}{(x + 2)(x - 4)}$
38. $10 + 2i$
39. –3, multiplicity 2; 5, multiplicity 6
40. $\frac{7}{6}$
41. asymptote: $x = -4$ and hole: $x = 2$
42. $a_n = a_{n-1} + 2$, where $a_1 = 8$; 18
43. Not Arithmetic
44. 135
45. $x = 77$, $y = 57$
46. Same Side Interior Angles