Geometry First Semester Final Review

1. How many gallons of a 40% alcohol solution must be mixed with 60 gallons of a 22% solution to obtain a solution that is 30% alcohol?

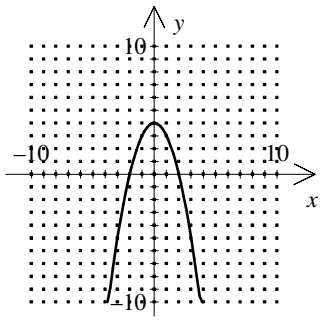
   [A] 48 gallons [B] 13.2 gallons [C] 4.8 gallons [D] 132 gallons

2. How much pure water must be mixed with 8 pints of 80% developer to produce a mixture that is 18% developer?

   [A] $27\frac{5}{9}$ pt [B] 28 pt [C] $35\frac{1}{9}$ pt [D] $35\frac{5}{9}$ pt

3. Find $f(2)$ given $f(x) = 4x^2 - 3x - 9$. [A] –5 [B] –7 [C] 10 [D] 1

4. Determine whether the graph represents a function. If so, determine whether the graph is a one-to-one function or not.



   [A] a function, one-to-one [B] a function, not one-to-one

   [C] not a function [D] none of these

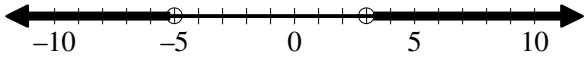
5. Which of the following is a function?

   [A] {(6, 1), (1, –4), (6, 0)} [B] {6, 1, –4, 0}

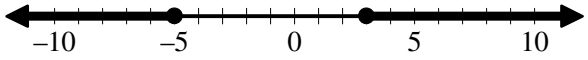
   [C] {(6, 1), (–4, 0), (–4, 6), (0, –4)} [D] {(6, 1), (1, 6), (0, 0)}

6. Graph the following set on the real number line. $\{x \in \mathbf{R} \mid |x+1| < 4\}$

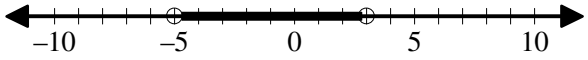
[A]



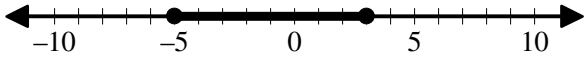
[B]



[C]



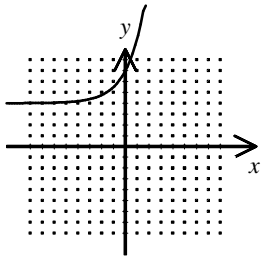
[D]



7. Make a table and sketch the graph of $f(x) = (4)^x$.

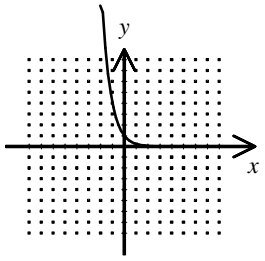
[A]

x	−3	−2	−1	0	1	2	3
y	5	6	7	8	12	16	20



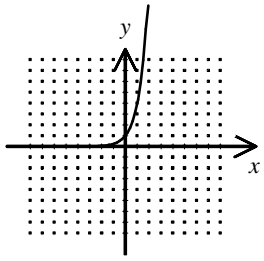
[B]

x	−3	−2	−1	0	1	2	3
y	64	16	4	1	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$



[C]

x	−3	−2	−1	0	1	2	3
y	$\frac{1}{64}$	$\frac{1}{16}$	$\frac{1}{4}$	1	4	16	64



[D] none of these

8. Draw reference triangles to evaluate $\frac{5\sqrt{3}}{3}\sin 60° + \frac{5\sqrt{2}}{3}\sin 45° - \frac{4\sqrt{3}}{3}\cos 30°$. Do not use a calculator.

[A] $-\frac{7}{6}$ [B] $\frac{17}{6}$ [C] $\frac{13}{6}$ [D] $\frac{37}{6}$

9. Given $f(x) = \frac{x-4}{x}$ and $g(x) = x^2 - 5$, find $(g \circ f)(-6)$.

[A] $-\frac{20}{9}$ [B] $\frac{27}{31}$ [C] $-\frac{10}{3}$ [D] $-\frac{116}{25}$

10. Tom is 6 times as old as Todd. In 5 years Tom's age will be 17 years more than 3 times as old as Todd. How old is Tom?

[A] 55 [B] 52 [C] 57 [D] 54

11. One machine can make 25 levers in 5 minutes. Another machine can make 56 levers in 8 minutes. The second machine began making levers 2 minutes before the first began. How long will it take the two machines together to finish making 170 levers?

[A] 13 min. [B] 14 min. [C] 15 min. [D] Not enough information min.

12. Write the equation $3125^{4/5} = 625$ in logarithmic form.

[A] $5\log_4 625 = 3125$ [B] $\log_{3125} 625 = \frac{4}{5}$

[C] $\log_{625} 3125 = \frac{5}{4}$ [D] $\log_{4/5} 625 = 3125$

13. Solve: $\log_6 x = 3$ [A] $\sqrt[3]{6}$ [B] 216 [C] $\sqrt[6]{3}$ [D] 729

14. Evaluate: $3 \sin 210°$ [A] $-2\sqrt{3}$ [B] 1 [C] $2\sqrt{2}$ [D] $-\frac{3}{2}$

15. Evaluate $\frac{6!}{3!3!}$. Do not use a calculator. [A] 64 [B] 2 [C] 120 [D] 20

16. A jet traveled at q meters per second for r meters and was 7 seconds late for a rendezvous. How fast should the jet have traveled in order to make the rendezvous?

[A] $\frac{rq}{q + 7r}\frac{\text{m}}{\text{s}}$ [B] $\frac{r}{q - 7r}\frac{\text{m}}{\text{s}}$ [C] $\frac{rq}{r - 7q}\frac{\text{m}}{\text{s}}$ [D] $\frac{q}{r + 7q}\frac{\text{m}}{\text{s}}$

17. Solve: $\begin{cases} x^2 + y^2 = 64 \\ x + y = 8 \end{cases}$

[A] $\{(0, -8), (-8, 0)\}$ [B] $\{(0, 8), (8, 0)\}$

[C] $\{(8, -8), (-8, -8)\}$ [D] $\{(0, 0), (8, -8)\}$

18. Factor: $2x^2y^{12} - 250x^2z^9$

[A] $2x^2(y^4 - 5z^3)(y^8 + 5y^4z^3 + 25z^6)$ [B] $2y^4 - 5z^3(y^4 - 10z^3)(2y^8 + 25z^3)$

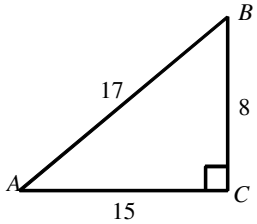
[C] $2x^2(y^4 - 5z^3)(y^8 - 10y^4z^3 + 25z^6)$ [D] $x^2(2y^4 - 5z^3)\left(y^4 - 10z^3\right)^2$

19. Simplify: $\dfrac{\frac{5}{2x} - \frac{3}{3x}}{\frac{2}{x} - \frac{3}{2x}}$ [A] 3 [B] $\frac{2}{12x^2}$ [C] $\frac{1}{3}$ [D] $\frac{8}{12x^2}$

20. Solve for j: $o = m\left(\frac{il}{j} + \frac{n}{k}\right)$

[A] $j = \frac{ikml}{ko - nm}$ [B] $j = \frac{nmk}{ko + ilm}$ [C] $j = \frac{ko + nm}{ikml}$ [D] $j = \frac{nmk}{ko - ilm}$

21. In the right triangle below $\frac{8}{17}$ represents which trigonometric function?



[A] sin B [B] cos B [C] tan A [D] cos A

22. An airplane is flying at an altitude of 5600 ft above the ground. The pilot sights an object on the ground at an angle of depression of 23°. What is the slant range from the airplane to the object?

[A] 13,832.11 ft [B] 14,332.11 ft [C] 14,382.11 ft [D] 14,432.11 ft

23. Convert $1.3i + 8.4j$ to polar coordinates. (Write four forms for the point.)

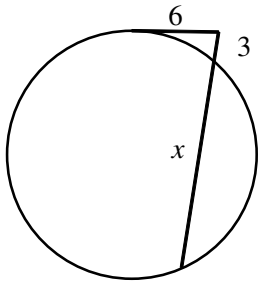
[A] $8.5\angle 81.2°$, $-8.5\angle 261.2°$, $8.5\angle -278.8°$, $-8.5\angle -98.8°$

[B] $8.5\angle 8.8°$, $-8.5\angle 188.8°$, $8.5\angle -351.2°$, $-8.5\angle -171.2°$

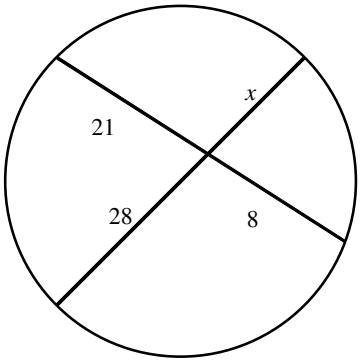
[C] $8.5\angle 8.8°$, $-8.5\angle 188.8°$, $8.5\angle -278.8°$, $-8.5\angle -98.8°$

[D] $8.5\angle 81.2°$, $-8.5\angle 261.2°$, $8.5\angle -351.2°$, $-8.5\angle -171.2°$

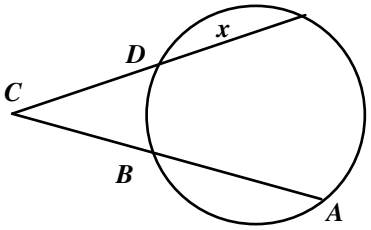
24. Solve for x. [A] 6 [B] 9 [C] 3 [D] 10



25. Solve for x. [A] 8 [B] 6 [C] 28 [D] 21



26. Find the value of x if $AB = 19,\ BC = 14,$ and $CD = 13.$



[A] 24.8 [B] 19.4 [C] 20.9 [D] 22.5

27. Find the sum of the measures of the interior angles of a hexagon.

[A] $900°$ [B] $540°$ [C] $720°$ [D] $360°$

28. Solve by the quadratic formula: $x^2 = -5x - 1$

[A] $\frac{5 + \sqrt{21}}{2},\ \frac{5 + \sqrt{21}}{2}$ [B] $5 + \sqrt{21},\ 5 + \sqrt{21}$

[C] $-5 + \sqrt{21},\ -5 - \sqrt{21}$ [D] $\frac{-5 + \sqrt{21}}{2},\ \frac{-5 - \sqrt{21}}{2}$

29. Find the equation of the line that passes through the point (–2, –4) and is parallel to the line $2x - y = 5$.

[A] $2x - y = 0$ [B] $-2x - 4y = 5$ [C] $2x + y = 5$ [D] $2x - y = -6$

30. Simplify: $\frac{-3 - 3i + i^3}{2 + i}$ [A] $-2 + i$ [B] $-2 - i$ [C] $2 - i$ [D] $2 + i$