Math Department

Final Exam Math 125/128

Do NOT write on Exam!

Do all work on scratch paper.

Put answers on scantron.

ABSOLUTELY NO CELL PHONES ALLOWED.

VERSION C TEST#: 210

Spring 2013

Solve.

1. $-2|x-2|+10=-6$ [A] $\varnothing$ [B] $\{10, -6\}$ [C] $\{6, -10\}$ [D] $\{2\}$

2. $|5x+1|>2$

[A] $\left\{x \mid -\frac{3}{5}<x<\frac{1}{5}\right\}$ [B] $\left\{x \mid x<-\frac{3}{5} \text{ or } x>\frac{1}{5}\right\}$

[C] $\left\{x \mid x \le -\frac{3}{5} \text{ or } x \ge \frac{1}{5}\right\}$ [D] none of these

3. How much pure water must be mixed with 9 pints of 90% developer to produce a mixture that is 24% developer?

[A] $24\frac{3}{8}$ pt [B] $33\frac{3}{8}$ pt [C] $24\frac{3}{4}$ pt [D] $33\frac{3}{4}$ pt

4. Chris and Leslie drove a total of 594 miles in 12.6 hours. Chris drove the first part of the trip and averaged 55 miles per hour. Leslie drove the remainder of the trip and averaged 45 miles per hour. How long did Chris drive?

[A] 9.9 hr [B] 3.8 hr [C] 8.8 hr [D] 2.7 hr

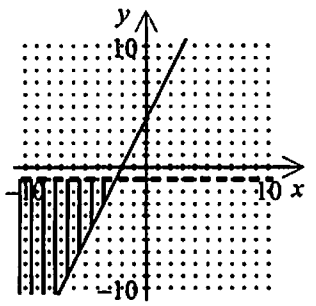
5. Determine the equation of the line, in slope-intercept form, that contains the points. $(5, -6)$ and $(9, -1)$

[A] $y=\frac{4}{5}x+\frac{49}{4}$ [B] $y=-\frac{4}{5}x+\frac{4}{49}$ [C] $y=\frac{5}{4}x-\frac{49}{4}$ [D] $y=\frac{5}{4}x-\frac{4}{49}$

6. Solve. $\begin{aligned} x-y+2z&=-4 \\ 3x+y-4z&=-6 \\ 2x+3y-4z&=4 \end{aligned}$ [A] x = -2 [B] $y=2$ [C] $z=6$ [D] none of these

7. Graph the solution set. $y \le 2x + 4$
$y < -1$

[A]



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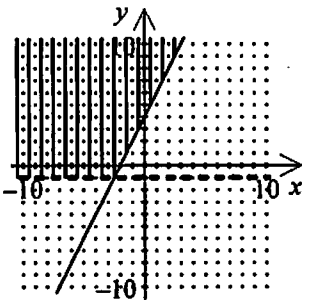

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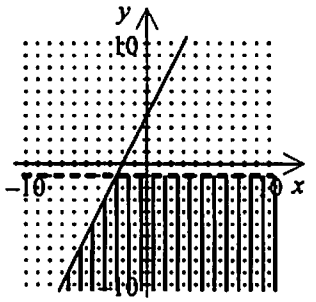

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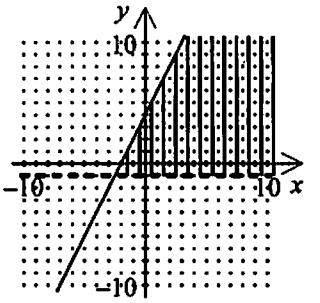


8. In the first week of May, a custom fencing company sold 1800 feet of pasture fencing and 350 feet of picket fencing for a total of \$15,525. The next week, at the same price, the fencing company sold 1400 feet of pasture fencing and 450 feet of picket fencing for a total cost of \$14,475. Find the cost per foot of the picket fencing.

[A] \$13.50 [B] \$7.00 [C] \$6.00 [D] \$15.00

Solve by factoring.

9. $8x(x^2 + 10x + 9) = 0$ [A] 0 [B] −1, −9 [C] 0, −1, −9 [D] −9

10. $4x^2 - 5x - 6 = 0$ [A] $-2, -\frac{3}{4}$ [B] $-2, \frac{3}{4}$ [C] $2, -\frac{3}{4}$ [D] $2, \frac{3}{4}$

11. Determine the domain of the function. $h(x) = \frac{6x}{x(x^2 - 25)}$

[A] $\{x \mid x \ne 5 \text{ and } x \ne -5\}$ [B] $\{x \mid x \ne 5 \text{ and } x \ne -5 \text{ and } x \ne 0\}$

[C] $\{x \mid x \ne 25 \text{ and } x \ne -25 \text{ and } x \ne 0\}$ [D] $\{x \mid x \ne 5\}$

12. Solve. $1-\frac{8}{x-3}=-\frac{48}{x^2-9}$

[A] -5 or 3 [B] 5 [C] 3 or 5 [D] no solution

Simplify.

13. $\frac{5}{x^2-15x+54}-\frac{2}{x-6}$

[A] $\frac{-2x-4}{x^2-15x+54}$ [B] $\frac{-2x+23}{x^2-15x+54}$ [C] $\frac{3}{x^2-16x+60}$ [D] $\frac{-2x-13}{x^2-15x+54}$

14. $\frac{\left(16-\frac{1}{x^2}\right)}{\left(\frac{1}{4x^2}-4\right)}$ [A] -4 [B] $\frac{17}{4}$ [C] $-\frac{1}{12x^2}$ [D] $\frac{5}{12x^2}$

15. $(3x^3-x-8)\div(x-3)$

[A] $3x^2+8x+16+\frac{48}{x-3}$ [B] $3x^2+9x+26+\frac{70}{x-3}$

[C] $3x^2+9x-28-\frac{93}{x-3}$ [D] $3x^2+8x-24-\frac{80}{x-3}$

16. Solve. $2x^{2/5}+3x^{1/5}+1=0$

[A] 1, $\sqrt{6}$ [B] 1, 6 [C] -1. -1/32 [D] ±1, $\pm\sqrt{6}$

17. The price per person of renting a bus varies inversely with the number of people renting the bus. It costs \$25 per person if 48 people rent the bus. How much will it cost per person if 71 people rent the bus? Round to the nearest cent.

[A] \$32.22 [B] \$47.21 [C] \$14.30 [D] \$16.90

18. Rewrite the exponential expression as a radical expression.

$a^{8/3}$

[A] $\sqrt[3]{a^8}$ [B] $\sqrt{a^{8/3}}$ [C] $\frac{1}{\sqrt[3]{a^8}}$ [D] $\sqrt{a^{3/8}}$

19. Determine the domain of the function $f(x)=\sqrt{x+9}+5$.

[A] domain $\{x \mid x \geq -9\}$

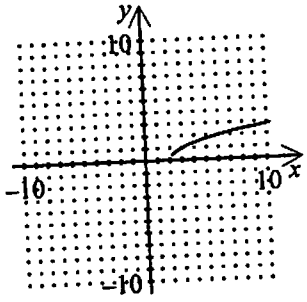
[B] domain $\{x \mid x \geq 0\}$

[C] domain $\{x \mid x \leq 0\}$

[D] domain $\{x \mid x \geq 9\}$

20. Graph: $f(x)=\sqrt{x+2}$

[A]



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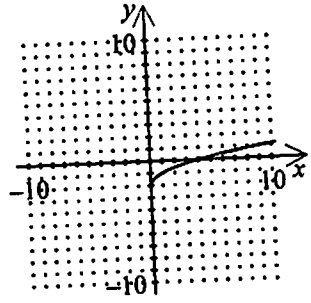

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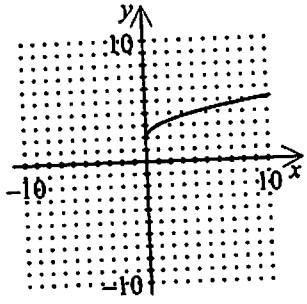

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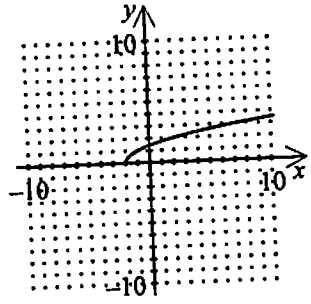


21. Solve. $\sqrt{r+9}+3=r$

[A] -7 [B] 7 [C] 0, 7 [D] -7, 7

22. A certain gas will escape from a storage tank according to the formula $E=150\sqrt{p}$, where E represents the amount escaping per minute in gallons, and p represents the pressure inside the tank in pounds per square inch. Which is the pressure when about 275 gallons per minute are escaping? Round to the nearest tenth of a lb/in^2.

[A] $3.4\ \text{lb/in}^2$ [B] $1.8\ \text{lb/in}^2$ [C] none of these [D] $0.5\ \text{lb/in}^2$

23. Simplify. $\dfrac{1+4i}{10+i}$

[A] $-\dfrac{14}{101}-\dfrac{39}{101}i$ [B] $\dfrac{14}{101}+\dfrac{39}{101}i$ [C] $\dfrac{14}{101}-\dfrac{39}{101}i$ [D] $-\dfrac{14}{101}+\dfrac{39}{101}i$

24. Solve using the quadratic formula. $x^2+2x+17=0$

[A] $1+4i,\ 1-4i$ [B] $-1+4i,\ -1-4i$ [C] $1+8i,\ 1-8i$ [D] $-1+8i,\ -1-8i$

25. Solve. $x^2-x-56<0$

[A] $\{x|x<-8 \text{ or } x>7\}$ [B] $\{x|-7<x<8\}$

[C] $\{x|x<-7 \text{ or } x>8\}$ [D] $\{x|-8<x<7\}$

26. When a rocket is shot into the air, its height h, in feet above the ground, is a function of time t, in seconds. The height of the rocket can be found using the formula $h(t)=128t-16t^2$.

After how many seconds will the rocket be at a height of 192 feet?

[A] 5 and 3 [B] 6 [C] 6 and 2 [D] 8

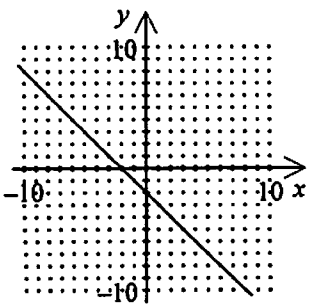
27. For the pair of functions, find $(f\circ g)(x)$.

$f(x)=x-2,\ g(x)=\sqrt{x+3};\ x\geq -3$

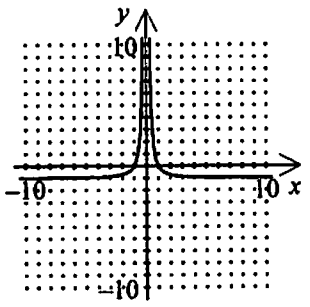
[A] $\sqrt{x+3}-2$ [B] $\sqrt{x+3}$ [C] $\sqrt{x+1}$ [D] $\sqrt{x-2}+3$

28. Which of the following are one-to-one functions?

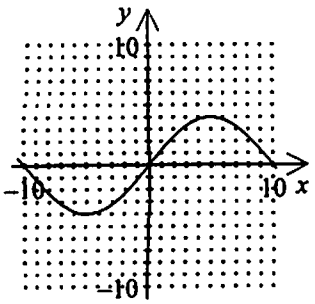
i.



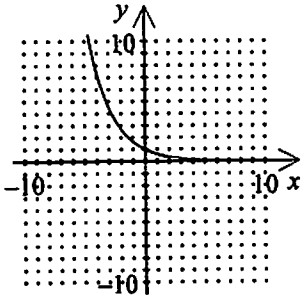
ii.



iii.



iv.



[A] iv only [B] ii and iv only [C] i, ii, and iv only [D] i and iv only

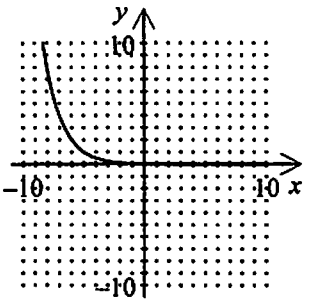
29. Find the inverse of the function. $f(x) = 2x + 4$

[A] $f^{-1}(x) = \frac{x-4}{2}$ [B] $f^{-1}(x) = \frac{2x-4}{2}$

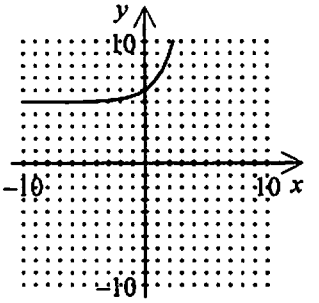
[C] $f^{-1}(x) = 4x+2$ [D] $f^{-1}(x) = \frac{x+4}{2}$

30. Identify the graph of the function. $f(x) = 2^x - 5$

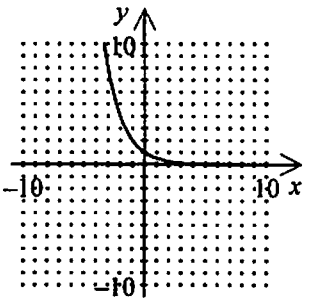
[A]



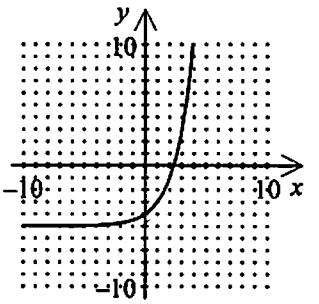
[B]



[C]



[D]



31. Identify the logarithmic expression written in exponential form. $\log_6 \frac{1}{1296} = -4$

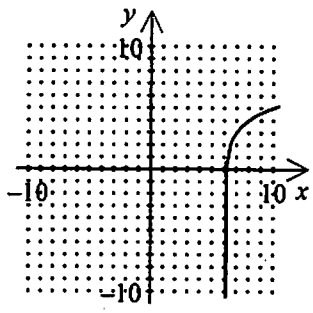
[A] $6^{-4} = \frac{1}{1296}$ [B] $4^6 = -1296$ [C] $4^6 = -\frac{1}{1296}$ [D] $6^{-4} = 1296$

32. Which is the logarithm written as a single expression?
$\ln x + 7(\ln y - \ln z)$

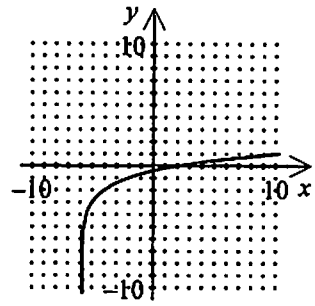
[A] $\ln \frac{xy^7}{z^7}$ [B] $\ln \frac{xy}{z}$ [C] $\ln \frac{x+7y}{7z}$ [D] none of these

33. Identify the graph of the logarithmic function. $f(x) = \log_2(x-6)$

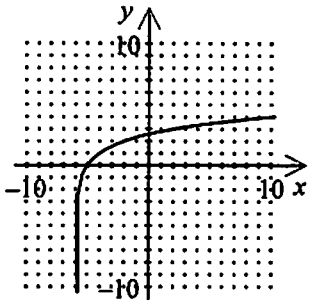
[A]



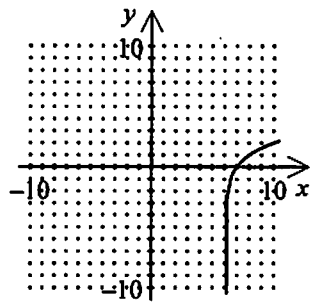
[B]



[C]



[D]



34. Solve for x.. Round your answer to nearest ten-thousandth. $4^{5x-7} = 27$

[A] 1.8755 [B] 2.7500 [C] 1.4841 [D] -0.0500

35. Solve for x. $\log_9(x+3) - \log_9(x+1) = \log_9 3$ [A] -4 [B] 0 [C] $\frac{3}{2}$ [D] 1

36. The percent of students who recall the important features of a lecture is given by $P = 0.95 - 0.30 \log_2(x)$ where P is the percent (expressed as a decimal) and x is the number of days that have passed since the lecture was given. After how many days will 35% of the students recall the important features of the lecture?

[A] 1.5 days [B] 4 days [C] 16 days [D] 58.9 days

37. Identify the equation of the circle with the given center and radius.
center: $(-1, -5)$; radius $= 8\sqrt{2}$

[A] $(x+1)^2+(y-5)^2=128$

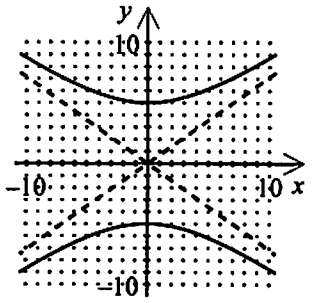
[B] $(x+1)^2+(y+5)^2=128$

[C] $(x-1)^2+(y-5)^2=8\sqrt{2}$

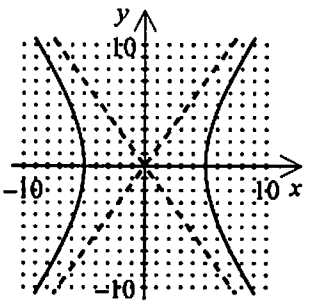
[D] $(x-1)^2-(y-5)^2=8\sqrt{2}$

38. Identify the graph of the hyperbola given by the equation. $\frac{x^2}{49}-\frac{y^2}{25}=1$

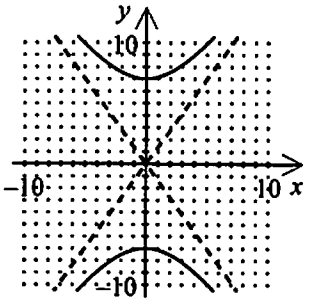
[A]



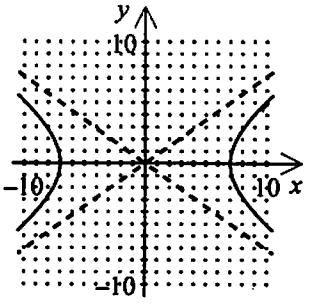
[B]



[C]



[D]



39. Solve the system. $y=x^2-8x+20$
$x-2y=-4$

[A] $(4, 4), \left(\frac{9}{2}, -\frac{9}{2}\right)$

[B] $\left(\frac{9}{2}, \frac{17}{4}\right), (5, -4)$

[C] $\left(\frac{9}{2}, \frac{17}{4}\right), (4, 4)$

[D] no real solution

40. Write in expanded form.
$(a-3b)^4$

[A] $a^4+12a^3b+54a^2b^2+108ab^3+81b^4$

[B] $a^4-12a^3b+18a^2b^2-12ab^3+81b^4$

[C] $a^4+12a^3b+18a^2b^2+12ab^3+81b^4$

[D] $a^4-12a^3b+54a^2b^2-108ab^3+81b^4$