Exam Review #1 Goals Numbers & Algebra

Name: Key

1. Which function has a remainder of 3 when divided by $x+2$?

A. $f(x)=x^2-6x+11$ **B.** $f(x)=x^2+3x+5$ **C.** $f(x)=x^2-4x+7$ **D.** $f(x)=x^2+6x+5$

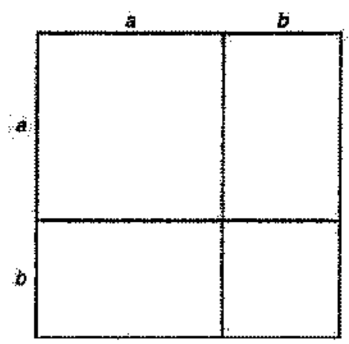
$(-2)^2+3(-2)+5 = 3$ remainder thm.; long division: $-2 \,|\, 1 \;\; 3 \;\; 5$ → $1 \;\; 1 \;\; 3$ R

2. When dividing the polynomial $p(t)=4t^3-17t^2+14t-3$ by $t-3$, the remainder can be determined by evaluating $p(3)$. What is the value of this remainder?

A. $p(3)=-27$ **B.** $p(3)=-6$ **C.** $p(3)=0$ **D.** $p(3)=45$

$4(3)^3-17(3)^2+14(3)-3 = -6$; $3 \,|\, 4 \;\; -17 \;\; 14 \;\; -3$ → $4 \;\; -5 \;\; -1 \;\; -6$ R

3. In the diagram below $a \neq b$.

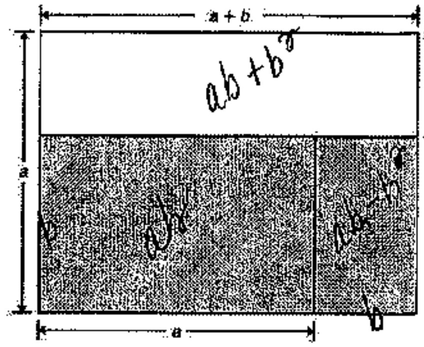


Which polynomial identity could the diagram be used to prove?

A. $a^2+b^2=c^2$ (rt. △s only) **B.** $(a+b)(a-b)=a^2-b^2$

C. $(a+b)^2=a^2+2ab+b^2$ (Area) **D.** $(a+b)^3=a^3+3a^2b+3ab^2+b^3$ (volume of a cube)

4. **The figure shown is a large rectangle composed of smaller rectangles. The difference in areas of the large rectangle and the white rectangle is equal to the area of the shaded region.**



Which of the following could be proved as a polynomial identity using the figure?

A. $a^2 + b^2 = (a + b)^2$ **B.** $(a + b)(a - b) = a^2 - b^2$

C. $(a + b)^2 = a^2 + 2ab + b^2$ **D.** $(a - b)^2 = a^2 - 2ab + b^2$

5. **Which expression is a common factor of both the numerator and denominator in the expression below?**

$$\frac{12rq^2 - 3rq^3}{12r^2q - 3r^2q^2}$$

A. $4q - r$ **B.** $4r - q$ **C.** $4 - q$ **D.** $4 - r$

6. Which of these expressions is equivalent to $\frac{(w^2 - 2w)}{(w^2 + 3w - 10)}$?

A. $1 - \frac{5}{w + 5}$ **B.** $1 + \frac{5}{w + 5}$ **C.** $5 - \frac{1}{w + 5}$ **D.** $5 + \frac{1}{w + 5}$

7. **Which rational expression is equivalent to** $\frac{2}{y + 9} + \frac{2}{y - 10}$?

A. $\frac{4}{2y - 1}$ **B.** $\frac{4y - 2}{2y - 1}$ **C.** $\frac{4}{(y + 9)(y - 10)}$ **D.** $\frac{4y - 2}{(y + 9)(y - 10)}$

8. **Which expression is equivalent to** $\left(\frac{x^2-3x+2}{x^2+3x+2}\right)\left(\frac{8x+8}{4x-8}\right)$?

$\frac{(x-2)(x-1)}{(x+2)(x+1)} \cdot \frac{8(x+1)}{4(x-2)} = \frac{2(x-1)}{(x+2)}$

A. $\frac{2(x-1)}{x-2}$ **B.** $\frac{2(x-1)}{x+2}$ **C.** $\frac{2(x+1)}{x-2}$ **D.** $\frac{2(x+1)}{x+2}$

9. **Mai Ly's bag contains red and blue beads. The number of red beads in the bag (*r*) is at least $\frac{2}{3}$ the number of blue beads in the bag (*b*). There are at most 400 beads in the bag. Which system of inequalities could be used to determine the number of red beads in Mai Ly's bag?**

A.
$r \geq \frac{2}{3}b$
$r + b \leq 400$
$r \geq 0$
$b \geq 0$

$R \geq 2/3 B$
$R + B \leq 400$

B.
$r \leq \frac{2}{3}b$
$r + b \geq 400$
$r \geq 0$
$b \geq 0$

C.
$r \geq \frac{2}{3}(r + b)$
$r + b \leq 400$
$r \geq 0$
$b \geq 0$

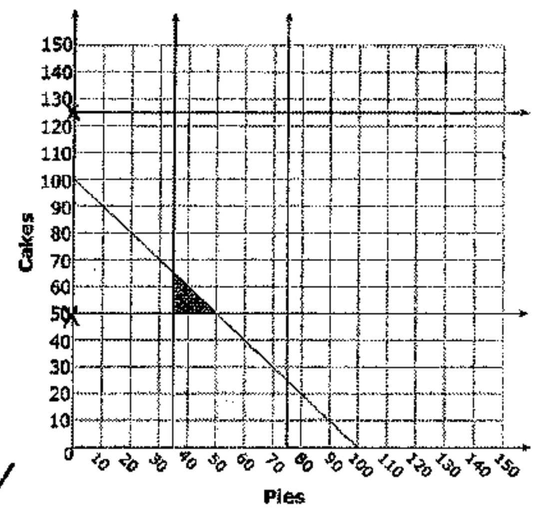
D.
$r \leq \frac{2}{3}(r + b)$
$r + b \geq 400$
$r \geq 0$
$b \geq 0$

10. A bakery sells pies and cakes.

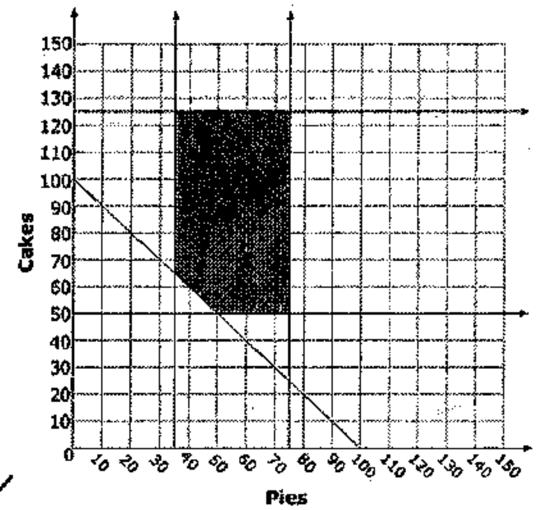
- The bakery expects to sell at least 50 pies and 35 cakes per day.
- The bakery is not capable of making more than 125 pies and 75 cakes each day.
- A total of at least 100 desserts must be delivered each day to satisfy delivery contracts.

Which graph shows the region containing the number of pies, x, and the number of cakes, y, that should be made each day?

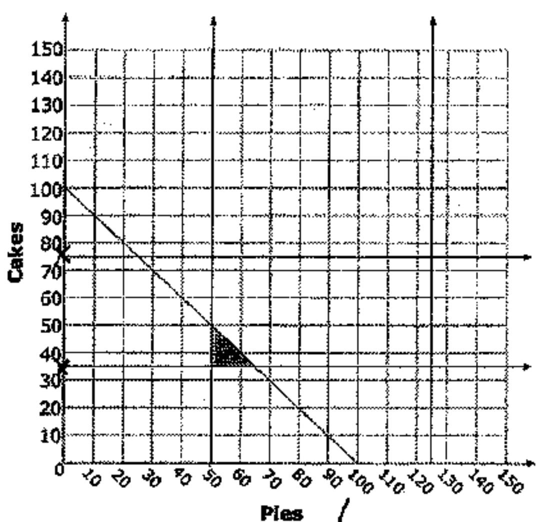
A.



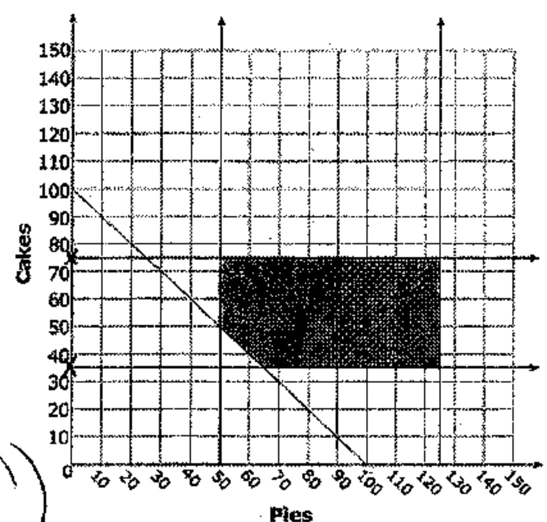
B.



C.



D.



11. **Which of the following equations is equivalent to $\sqrt{3-2x} = x$?**

A. $\sqrt{3} - \sqrt{2x} = x$ **B.** $3 - 2x = \sqrt{x}$ **C.** $\sqrt{3} - x = \sqrt{x}$ **D.** $3 - 2x = x^2$

12. **What is the value of z?**

A. 4 **B.** 9 **C.** 16 **D.** 25

13. **Two functions are shown below.**

$$f(x) = 2x^2 - 15x + 20$$
$$g(x) = -4x^2 + 16x - 12$$

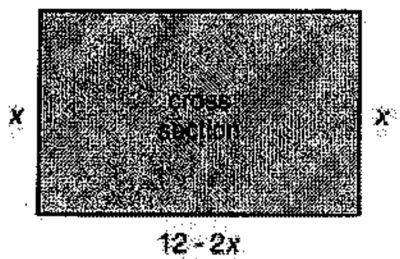
Which ordered pair best approximates a point of intersection for the graphs of the two functions?

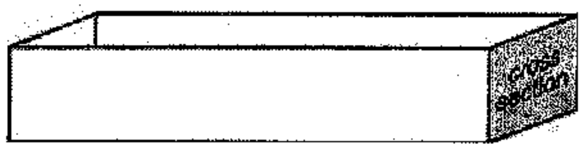
A. $(1.42, -8.12)$ **B.** $(3.74, -8.12)$ **C.** $(1.73, 0)$ **D.** $(3.74, 2.68)$

14. Which statement is true about the equation $f(x) = g(x)$ given $f(x) = 2x + 3$ and $g(x) = x^2$?

A. It has two solutions at -1 and 3.
B. It has two solutions at -1.5 and 0.
C. It has four solutions at $-1, 1, 3,$ and 9
D. It has four solutions at $-1.5, -1, 0,$ and 3.

15. **Livestock watering troughs are often custom-made from long metal sheets by bending two sides upward and adding left and right ends. The trough shown below is made from a 12-foot wide strip of metal with the cross-sectional area $A(x) = x(12 - 2x)$ square inches.**





For what value of *x* will the trough have maximum cross-sectional area?

A. $\frac{1}{12}$ **B.** $\frac{1}{3}$ **C.** 3 **D.** 12

y = .986 y = 3.18 y = 18 y = -144

16. **Complete the square for the function $f(x) = x^2 - 4x + 6$. What is the minimum point on a graph of this function?**

A. (1, –2) **B.** (–2, 1) **C.** (–2, –2) **D.** (2, 2)

$x^2 - 4x + 4 = -6 + 4$
$(x-2)^2 = -2$
$(x-2)^2 + 2 = 0$

$\frac{-4}{2} = (-2)^2$

$(x-h)^2 + k = 0$ → vertex form

17. **What are the solutions to $6x^2 = 5x - 3$?**

A. $\frac{-5 \pm i\sqrt{97}}{12}$ **B.** $\frac{-5 \pm i\sqrt{47}}{12}$ **C.** $\frac{5 \pm i\sqrt{47}}{12}$ **D.** $\frac{5 \pm i\sqrt{97}}{12}$

$6x^2 - 5x + 3 = 0$ $\frac{5 \pm \sqrt{(5)^2 - 4(6)(3)}}{2(6)} = \frac{5 \pm i\sqrt{47}}{12}$

18. **Which value of *x* is a solution to $(3x + 5)^2 - 4x = 5$?**

A. $\frac{-13 - i\sqrt{11}}{9}$ **B.** $\frac{-13 - 2i\sqrt{11}}{18}$ **C.** $\frac{2 + 4i\sqrt{11}}{9}$ **D.** $\frac{2 + 8i\sqrt{11}}{9}$

$(3x+5)(3x+5) - 4x = 5$
$9x^2 + 30x + 25 - 4x - 5 = 0$
$9x^2 + 26x + 20 = 0$

$\frac{-26 \pm \sqrt{(26)^2 - 4(9)(20)}}{2(9)} = \frac{-26 \pm i\sqrt{44}}{18}$

$\frac{-26 \pm 2i\sqrt{11}}{18} \div 2$