

Name _____

TAKE HOME FINAL #2

Semester Review WS #1

Will make up 10 points on the final... graded on accuracy

1. Factor completely :

(a) $x^2 - 7x - 60$ (b) $4x^2 + 20x - 24$ (c) $16x^2 - 56x + 49$ (d) $16n^4 - 64$
 $(x-12)(x+5)$ $4(x-1)(x+6)$ $(4x-7)^2$ $16(n^2+2)(n^2-2)$

2. Write a quadratic equation whose roots are -5 and 7 $f(x) = (x+5)(x-7) = x^2 - 2x - 35$

3. The roots of $x^2 + 3x - 8 = 0$ are $\bar{x} = \frac{-3 \pm \sqrt{41}}{2}$ or $-\frac{3}{2} \pm \frac{\sqrt{41}}{2}$

4. For the function $f(x) = x^2 - 5x + 6$, the zeros are? $x = 2, 3$

5. Write the solution of $x^2 + x + 5 = 0$.

$$x = -\frac{1}{2} \pm \frac{\sqrt{19}}{2}$$

6. What is the value of $\sqrt{-16} \cdot \sqrt{-25}$?

$$-20$$

7. Simplify: $(4+3i) + 2(3-5i)$

$$10 - 7i$$

8. Find the product of $(2+4i)(4-3i)$

$$20 + 10i$$

9. Find $(5i^{10})(-2i^6)(-4i^{26})$

$$-40$$

10. Simplify: $\frac{5-3i}{8+2i}$

$$\frac{1}{2} - \frac{1}{2}i$$

$$11. \left(\frac{4}{5}\right)^{-3} = \frac{125}{64}$$

12. What would you add to $x^2 - 5x + \frac{25}{4}$ to complete the square?

$$m = \frac{2}{-5}$$

13. What is the equation of the line which passes through the points (2,5) and (-3,7)?

$$y-5 = -\frac{2}{5}(x-2)$$

$$\text{or } y-7 = -\frac{2}{5}(x+3)$$

14. Write an equation of the line that is parallel to $y = \frac{2}{3}x - 4$ going through the point (-3, 5). Write your answer in slope-intercept form. $y-5 = \frac{2}{3}(x+3)$ $y = \frac{2}{3}x + 7$

15. Write an equation of the line that is perpendicular to $y = \frac{2}{3}x - 4$ going through the point (-3, 5).

Write your answer in point-slope form. $y-5 = -\frac{3}{2}(x+3)$

$$80 = (B-C)8 \quad 80 = (B+C)4$$

$$10 = B-C \quad 20 = B+C$$

$$30 = 2B$$

$$B = 15$$

$$C = 5$$

16. A boat travels 80 miles downstream in 4 hours. It makes the return trip, against the current, in twice the time. What is the speed of the current? 5 mph

17. State whether each vertex is a maximum or a minimum

A) $y = 5x^2 - 2$ Minimum

B) $y = -2(x+4)^2 + 9$ Maximum

C) $y = \frac{1}{3}(x-5)^2 - 4$ Minimum

18. Solve: $\frac{1}{3}|6x - \frac{1}{2}| = 9$

$$x = -\frac{53}{12} \text{ or } \frac{55}{12}$$

19. Convert 60 km/h to meters/s

$$\frac{60 \text{ km}}{\text{hour}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hour}}{3600 \text{ sec}} = \frac{50}{3} \text{ m/s} \text{ or } 16\frac{2}{3} \text{ m/s}$$

20. You wish to purchase a 14 pound bag of mixed nuts. Peanuts are \$5.00 per pound and almonds are \$6.00 per pound. How many pounds of peanuts should you buy if the entire bag costs \$74?

10 lbs

21. What is the vertex of $y = 2(x+3)^2 - 10$?

$(-3, -10)$

22. What is the transformation of $y = 2(x-9)^2 - 3$ from the parent graph $y = x^2$?

9 →, 3 ↓, Vertical Stretch by factor of 2

P	X	5
A	Y	6
Mix	14	74

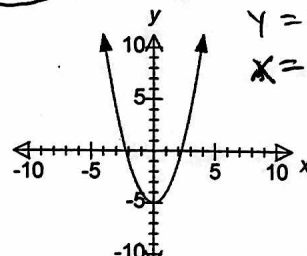
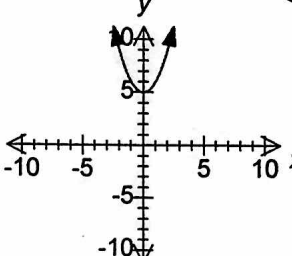
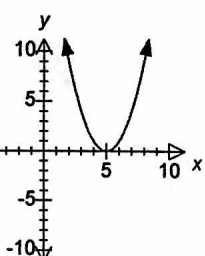
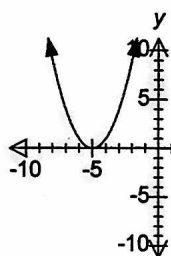
23. Which could be the graph of $y = x^2 - 5$?

A)

B)

C)

D)



$$\begin{aligned} X + Y &= 14 \\ 5X + 6Y &= 74 \\ -5X - 5Y &= -70 \\ \hline Y &= 4 \\ X &= 10 \end{aligned}$$

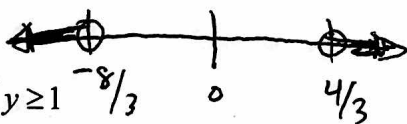
24. Simplify: $(3x^3 - 4x + 5) - 2(4x^3 + 3x^2 - 5x + 1)$

$$-5x^3 - 6x^2 + 6x + 3$$

25. $(3x^4 - 5x^3 + 7x + 4) \div (x - 2)$

$$3x^3 + x^2 + 2x + 11 + \frac{26}{x-2}$$

26. Graph $|3x + 2| - 4 > 2$ on the number line.



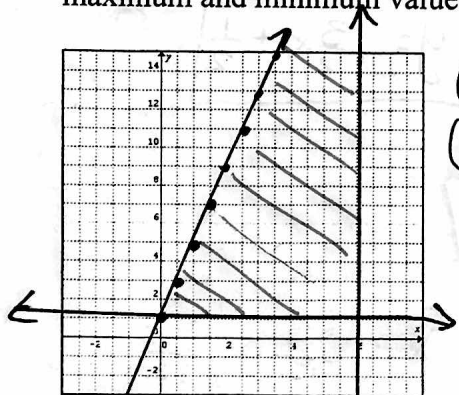
27. Graph:

$$\begin{cases} y \geq 1 \\ x < 6 \\ y \leq 2x + 1 \end{cases}$$

28. Solve the system:

$$\begin{cases} x + 2y + z = 10 \\ 2x - y + 3z = -5 \\ 2x - 3y - 5z = 27 \end{cases}$$

Find the corner-points of the feasible region. Use these corner-points to find the maximum and minimum values using $f(x, y) = 2x - 3y$



$(0, 1)$
 $(6, 1)$
 $(6, 13)$

$$\begin{aligned} f(0, 1) &= -3 \\ f(6, 1) &= 9 \text{ max} \\ f(6, 13) &= -27 \text{ min} \end{aligned}$$

$(7, 4, -5)$

29. Convert the following

a. 52 miles per hour to feet per second

b. 123,000,000 centimeters to kilometers

$$a) \frac{52 \text{ miles}}{\text{hour}} \times \frac{5280 \text{ ft}}{1 \text{ mile}} \times \frac{1 \text{ hour}}{3600 \text{ sec}} = 76.27 \text{ ft/sec}$$

$$b) 123,000,000 \text{ cm} \times \frac{1 \text{ m}}{100 \text{ cm}} \times \frac{1 \text{ km}}{1000 \text{ m}} = 1230 \text{ km}$$