

SST Fall Final Exam Practice

Name Key
Per _____

All answers must be exact and in simplest form unless stated otherwise. All problems should be completed WITHOUT a calculator.

1. Find and simplify $f(3) + g(2)$ for

$$f(x) = 2x - 5; \quad g(x) = 4x^2 - 2$$

$$f(3) = 2(3) - 5 = 6 - 5 = 1$$

$$g(2) = 4(2)^2 - 2 = 4(4) - 2 = 16 - 2 = 14$$

2. Solve $\left(3x - \frac{5}{3}\right) \left(\frac{3}{4}x + 2\right) = 14$

$$36x - 20 = 9x + 24$$

$$27x - 20 = 24$$

$$\frac{27x}{27} = \frac{44}{27}$$

$$x = 44/27$$

3. Solve for h given: $V = \frac{1}{3}\pi r^2 h$

$$3V = \pi r^2 h$$

1. 15

2. $x = 44/27$

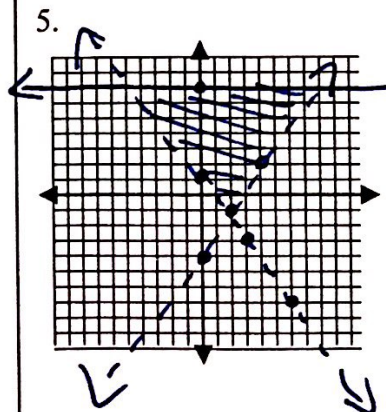
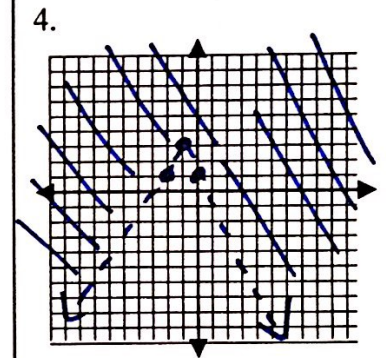
3. $h = \frac{3V}{\pi r^2}$

4. Graph the following function: $y > -2|x+1| + 3$

$$y > \frac{3}{2}x - 4$$

5. Graph the solution: $y > -\frac{4}{3}x + 1$

$$y \leq 7$$



6. Simplify: $(-2i^3)(-3i^{12})(4i^{15})$

15

$$24i^{30}$$

$$\frac{240}{28} \div \frac{2}{2} \quad i^2 = -1$$

6. -24

7. Find the equation of the line **parallel** to $y = \frac{5}{2}x - 4$ and going through the point $(-10, 6)$.

Leave answer in **slope-intercept form**.

$$y - 6 = \frac{5}{2}(x + 10) \quad y - 6 = \frac{5}{2}x + 25$$

8. Factor: $8x^3 + 27$

9. Solve: $6x^2 + 23x + 20 = 0$

$$(3x + 4)(2x + 5)$$

10. Solve using quadratic formula: $2x^2 - x + 5 = 0$

Simply the radical, if needed. Remember you can have complex numbers as solutions.

$$\frac{1 \pm \sqrt{1 - 4(2)(5)}}{2(2)} \quad \frac{1 \pm \sqrt{1 - 40}}{4}$$

11. Factor: $9x^2 - 16$

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

$$8x^2 - 6x + 2 - 3x + 6$$

13. Solve and simplify: $2|4x + 3| = 22$

$$4x + 3 = 11$$

$$4x = 8$$

$$x = 2$$

$$-2(3x + 6) = (13) - 2$$

$$|4x + 3| = 11$$

$$-4x - 3 = 11$$

$$-4x = 14$$

$$x = -14/4$$

14. Solve the system: $6x - 10y = -18$

$$3x + 12 = 13$$

$$3x = 1$$

$$x = 1/3$$

$$-6x - 12y = -26$$

$$-22y = -44$$

$$y = 2$$

15. Factor Completely:

$$6x^3 - 22x^2 + 12x$$

$$2x(3x^2 - 11x + 6)$$

$$2x(3x - 2)(x - 3)$$

$$y = \frac{5}{2}x + 31$$

$$8. (2x + 3)(4x^2 - 6x + 9)$$

$$9. -4/3, -5/2$$

$$10. \frac{1 \pm i\sqrt{39}}{4}$$

$$11. (3x - 4)(3x + 4)$$

$$12. 8x^2 - 9x + 8$$

$$13. x = 2, -7/2$$

$$14. (1/3, 2)$$

$$15. 2x(3x - 2)(x - 3)$$