

Preliminary Review Class Worksheet

(see web for expanded versions: 0/0-backgroundexamples.pdf and 0/2/expproblems.pdf)

Math 130 *Kovitz*

1. Solve for x : $2x^2 - x + \frac{1}{9} = 0$.

2. Simplify: $(x^2 - 1) - (x - 1)^2$.

3. Simplify to a single fraction: $\frac{x-1}{x+1} - \frac{4}{x^2-1}$.

4. If possible, simplify: $\sqrt{x^2 - 2x + 1}$.

Be careful! The first idea that comes to mind may not be correct for all possible x .

5. (a) Divide 4 by $-1/4$.

(b) Simplify $8 \div \frac{1}{3} + \frac{2}{3}$.

6. Subtract. $(5x^2 - 8x + 1) - (8x^2 - 2x + 6)$

7. Multiply. $-3a^2(a^2 - 4a + 5)$

8. Multiply:

(a) $(6x - 1)(2x + 5)$.

(b) $(2a - 7)^2 - 30$.

(c) $3(x - 1/4)^2 + 2$.

9. Divide. $\frac{72x^3 - 32x^2 + 8x}{8x}$

10. Factor.

(a) $3x^2 - 75$

(b) $9x^2 - 30x + 25$

(c) $x^2 + x - 12$

(d) $12x^2 - 17x - 40$

11. True or false?

(a) $(-2)(-3) = -(2)(3)$

(b) $\frac{-5}{-6} = -\left(\frac{5}{6}\right)$

12. (a) Simplify this expression so that it stays in factored form without a leading minus sign.

$$-[(2 - \sqrt{2})(3 - \sqrt{3})]$$

(b) Solve for x .

$$-x = \frac{\sqrt{6} - \sqrt{3}}{\sqrt{2} - \sqrt{5}}$$

13. Simplify.

(a) $\frac{ab - b^2}{5ab - 5a^2}$

(b) $\frac{x}{x-3} - \frac{x-7}{x-1} - \frac{1}{2}$

(c) $\frac{a^2 - 5}{a - b} + \frac{b^2 - 5}{b - a}$

14. Solve for x . $\frac{20}{x} + \frac{15}{x-7} = 7$.
15. Solve for d . $A = \frac{1}{2}h(c-d)$.
16. Solve for x . (real number solutions only)
- (a) $x^2 - 22x = 11$
 - (b) $x^2 - x + 1 = 0$
 - (c) $5x^2 - x - 4 = 0$
 - (d) $(x - 4139)^2 = 161^2$.
17. Simplify, if you can: $\sqrt{a^2 + b^2}$.

The remaining problems review rules of exponents.

18. Simplify: 4^{-2} , $4^{1/2}$, $4^{-3/2}$, $4^{-2/3}$, $256^{-3/4}$, $243 \cdot 6$, $144^{1/4} \cdot 144^{3/4}$, $16^{3/4} + 16^{1/4}$.
19. Simplify: $\left(\frac{1}{2}\right)^3 (-2)^3$, $\frac{3^2}{3^0}$, $\frac{(-2)^5}{(-2)^2}$.
20. *True or False?*
- (a) $4^{8/3} \cdot 4^{4/3} = 256$.
 - (b) $4^{8/3} \div 4^{2/3} = 16$.
 - (c) $8^{5/6} \div 8^{-1/6} = 4$.
 - (d) $(4^{4/3})^3 = (\sqrt[4]{4})^{16}$.
 - (e) $4^{3 \times 7} = 4^3 + 4^7$.
 - (f) $4^{3 \times 7} = 4^3 \cdot 4^7$.
 - (g) $4^{-3/4} = \sqrt{2}/4$.
 - (h) $\left(\frac{4}{\sqrt[3]{4}}\right)^4 = 64$.
 - (i) $8^{4/3} + 8^{2/3} = 24$.
21. Let $y = 16^x$
- (a) Find y when $x =$: $\frac{1}{4}$, -1 , 2 .
 - (*b) For which x is y equal to: 4 , $\frac{1}{16}$, $\frac{1}{\sqrt{2}}$, -256 ?
22. Simplify: $\sqrt{x} \cdot \sqrt{x}$.
23. Rewrite using positive exponents and then simplify: $x^{-2} + y^{-2}$.
24. Solve for x :
- $$8^x = \frac{1}{\sqrt[3]{4}}.$$
25. Solve for c and x .
- $$cx^2 = 0.5$$
- $$cx^5 = 32$$
26. Write in a simpler form: $(\sqrt[3]{6})^{3/2}$.