

Summer Packet: PreCalculus Honors

Topic 1: Factoring. Factor each expression

1.  $6x^2 + x - 12$

2.  $8x^2 - 19x + 6$

3.  $49 - 4x^2$

4.  $16x^2 + 72x + 81$

5.  $x^3 - 4x^2 - 25x + 100$

6.  $24x^5 + 18x^4 - 15x^3$

Topic 2: Complex Fractions. Simplify each complex fraction

7. 
$$\frac{\frac{5}{x} - 3}{4 + \frac{2}{x}}$$

8. 
$$\frac{6 + \frac{x+1}{4}}{2 - \frac{3}{x-1}}$$

9. 
$$\frac{3 + \frac{x}{x-2}}{\frac{4}{x}}$$

10. 
$$\frac{\frac{2x}{x+5}}{\frac{3x+1}{2}}$$

Topic 3: Interval Notation. Write each inequality in interval notation

11.  $x \leq -8$

12.  $-3 < x$

13.  $2 \leq x < 35$

14.  $x < -3$  or  $x \geq 1$

Topic 4: Domain. Write the domain of each function in interval notation

15.  $F(x) = 3x^2 - 7x + 5$

16.  $F(x) = \sqrt{x - 3}$

17.  $F(x) = \sqrt{9 - x}$

18.  $F(x) = \frac{3x-1}{x+5}$

19.  $F(x) = \frac{x+2}{x^2-4}$

20.  $F(x) = \frac{3-x}{x^2-x-6}$

Topic 5: Logarithms

21. Expand expression

a.  $\text{Log}(x^2(x - 1)^3)$

b.  $\log \frac{\sqrt{x}}{(3x+2)^2}$

c.  $\log \frac{x(y+3)^4}{y(x-1)}$

22. Evaluate each log expression

a.  $\text{Log}_2 8$

b.  $\text{Log}_3 \frac{1}{9}$

c.  $\text{Log}_4 2$

d.  $\text{Log}_7 1$

e.  $\text{Log}_3 18 - \log_3 2$

f.  $\text{Log} 2 + \log 5$

23. Solve each log equation

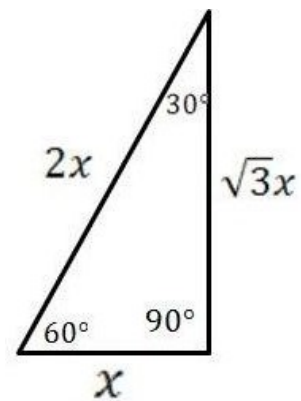
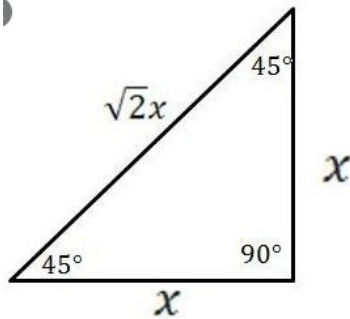
a.  $\text{Log}(x+2) + \log(x-1) = 1$

b.  $\text{Log}_2 3 + \log_2 x = \log_2 5 + \log_2(x-2)$

c.  $\text{Log}_5(x+1) - \log_5(x-1) = 2$

d.  $\text{Log}_9(x-5) + \log_9(x+3) = 1$

Topic 6: Special right Triangle



24. If the hypotenuse of a 45-45-90 triangle is 8 how long is each leg?

25. If the leg of a 45-45-90 triangle is  $3\sqrt{6}$  how long is the hypotenuse

26. If the shorter leg of a 30-60-90 triangle is  $5\sqrt{3}$  how long is the longer leg? The hypotenuse?

27. If the hypotenuse of a 30-60-90 triangle is 12 how long are the other sides?

28. If the longer leg of a 30-60-90 triangle is 15 how long are the other sides?