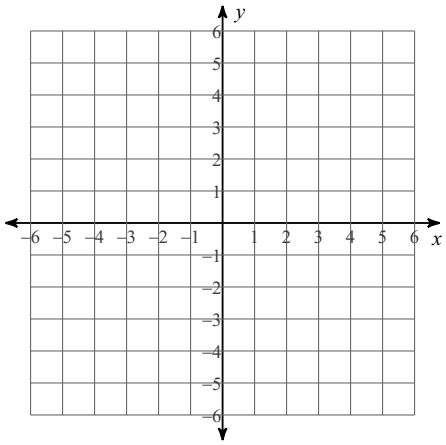
AP PreCalculus Name_____

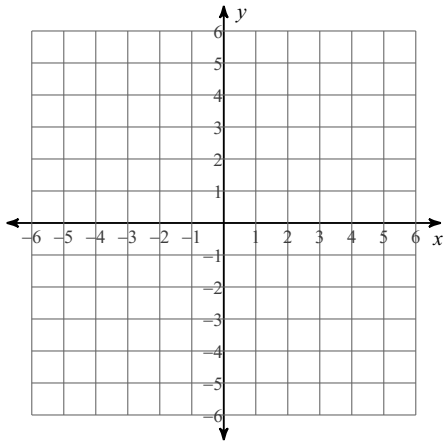
2025 Summer Packet

Sketch the graph of each line.

1) $2x = 10$



2) $-8x + 25 = -5y$



Write the slope-intercept form of the equation of the line described.

3) through: $(-4, -1)$, parallel to $y = \frac{1}{4}x + 1$

4) through: $(-2, 5)$, parallel to $y = 10x + 3$

Write the standard form of the equation of the line described.

5) through: $(2, 2)$, perp. to $y = \frac{4}{3}x + 4$

6) through: $(-3, 2)$, perp. to $y = 5$

Factor each.

7) $x^7 - x = 0$

8) $x^7 + 3x^5 - 25x^3 - 75x = 0$

Factor each completely.

9) $4n^3 + 49n^2 + 90n$

10) $9k^2 - 12k - 32$

11) $50x^2 - 195x + 70$

12) $9a^3 - 30a^2$

13) $60p^3 - 222p^2 + 180p$

14) $16x^3 - 28x^2 + 12x$

15) $9a^3 - 3a^2b - 2b^2a$

16) $8yx^2 - 6y^2x$

17) $10x^2 + 79xy - 8y^2$

18) $9x^2 - 27xy$

19) $9u^2 + 65uv - 56v^2$

20) $8x^2y - 65xy^2 + 8y^3$

21) $27m^3 - 1$

22) $3 + 24u^3$

23) $256 + 500u^3$

24) $500m^3 + 256$

Solve each equation by completing the square.

25) $x^2 - 14x + 54 = -4$

26) $r^2 + 10r + 27 = 6$

27) $n^2 - 6n - 45 = 10$

28) $n^2 - 4n + 78 = 2$

Solve each equation by factoring.

29) $35n^2 - 30 = 205n$

30) $4r^2 - 15 = -17r$

31) $49x^2 = -140x + 224$

32) $21m^2 = 14 - 43m$

Solve each equation by taking square roots.

33) $-7 - 8a^2 = -35$

34) $-7 - 8r^2 = -51$

Solve each equation with the quadratic formula.

35) $2b^2 + 11 = -9b$

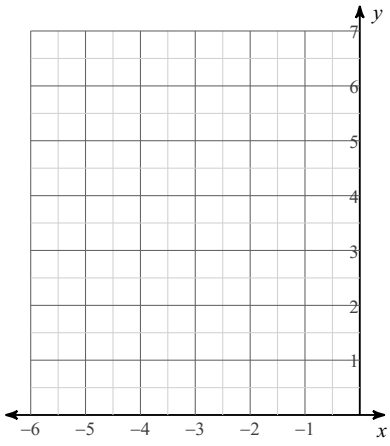
36) $3n^2 = 7$

37) $3x^2 + 5x = 22$

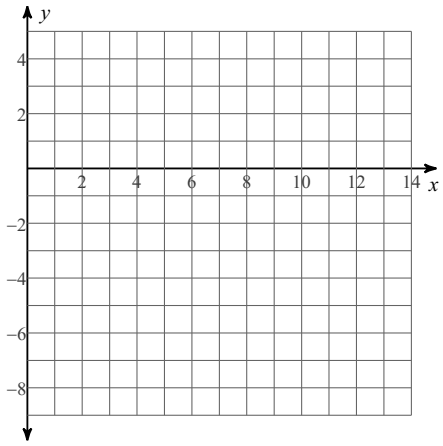
38) $11p^2 + 7p = -2$

Sketch the graph of each function.

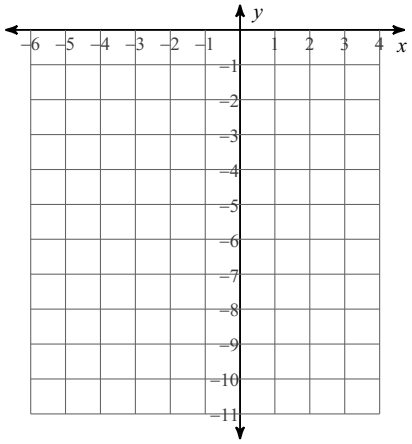
39) $f(x) = x^2 + 4x + 6$



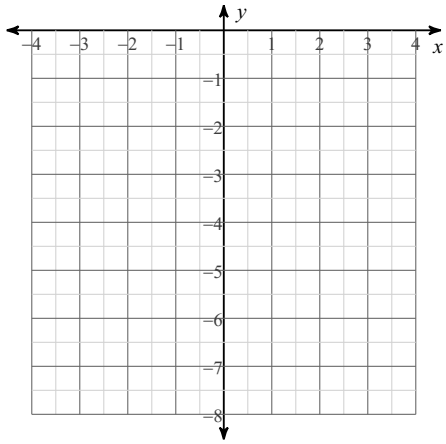
40) $f(x) = -3x^2 + 18x - 23$



41) $f(x) = -2(x+2)^2 - 2$



42) $f(x) = -(x-2)^2 - 3$



Divide using synthetic division.

43) $(9x^3 - 22x^2 - 2x + 21) \div (x - 2)$

44) $(3x^3 + 21x^2 + 22x + 29) \div (x + 6)$

45) $(7n^3 + 18n^2 - 46n - 22) \div (n + 4)$

46) $(10x^3 - 64x^2 + 21x + 28) \div (x - 6)$

Divide using long division.

47) $(9x^3 - 58x^2 - 12x + 16) \div (9x - 4)$

48) $(10p^3 + 77p^2 + 19p - 21) \div (10p + 7)$

Simplify each expression.

49) $\frac{8v}{5v - 60} \cdot \frac{5v - 90}{8v}$

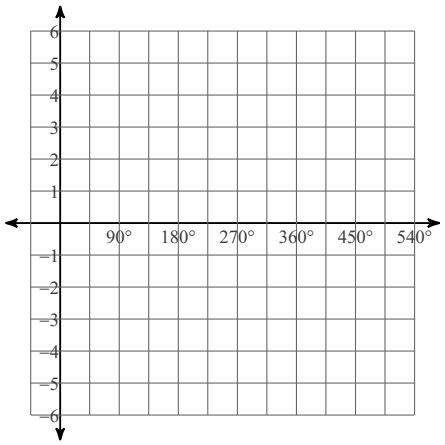
50) $\frac{18a + 342}{a - 7} \cdot \frac{1}{a + 19}$

51) $\frac{1}{6x + 42} \cdot \frac{5x^2 + 95x}{5x}$

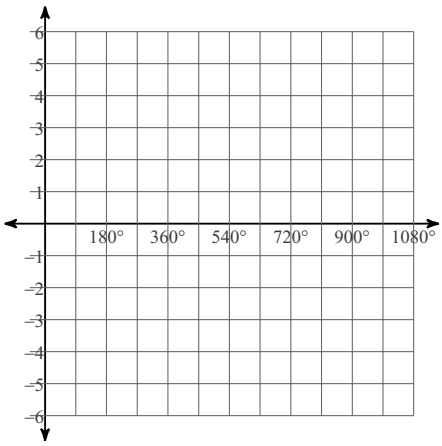
52) $\frac{1}{10b} \cdot \frac{9b^2 + 171b}{b + 19}$

Graph each function using degrees.

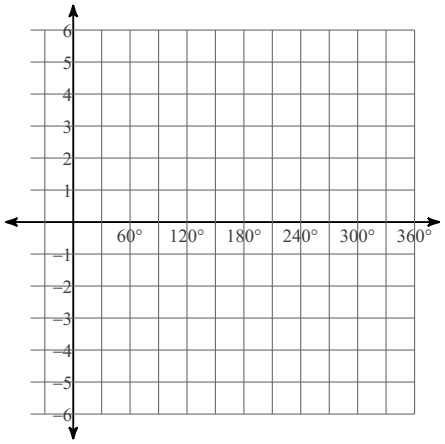
53) $y = 2\sin\theta$



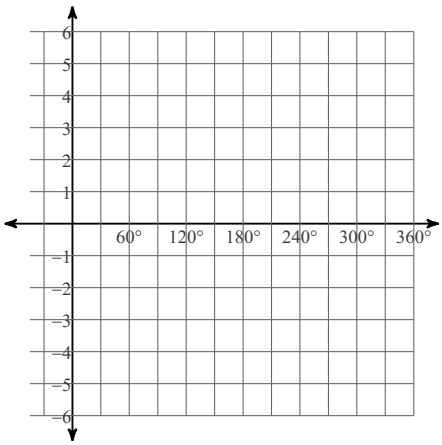
54) $y = 2\sin\left(\frac{\theta}{2} - 240\right)$



55) $y = 3\cos\left(3\theta - 240\right)$



56) $y = \frac{1}{2} \cdot \sin\left(4\theta + 60\right)$



Convert each degree measure into radians and each radian measure into degrees.

57) $-\frac{23\pi}{12}$

58) $-\frac{7\pi}{3}$

59) $\frac{13\pi}{4}$

60) -510°