

POLYNOMIAL REVIEW

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① DETERMINE IF EACH EXPRESSION IS A POLYNOMIAL. IF IT IS A POLYNOMIAL, FIND THE DEGREE AND DETERMINE IF IT IS A MONOMIAL, BINOMIAL, OR TRINOMIAL.

(A) $3y^2 - 2$ $d = 2$ BINOMIAL

(B) $4t^5 + 3t^2 + t$ $d = 5$ TRINOMIAL

(C) $\frac{3x}{5y}$ NOT.

(D) ax^{-3} NOT

(E) $3b^2$ $d = 2$ MONOMIAL

(F) $2x^{-3} + 4x + 1$ NOT.

② FIND EACH SUM OR DIFFERENCE.

(A) $(y^2 + 2y + 3) + (y^2 + 3y - 1) = 2y^2 + 5y + 2$

(B) $(3n^3 - 2n + 7) - (n^2 - 2n + 8) = \cancel{3n^3 - 2n + 7} 3n^3 - n^2 - 1$

(C) $(5d + d^2) - (4 - 4d^2) = 5d^2 + 5d - 4$

(D) $(x + 4) + (3x + 2x^2 - 7) = 2x^2 + 4x - 3$

(E) $(3a - 3b + 2) - (4a + 5b) = -a - 8b + 2$

(F) $(8x - y^2 + 3) + (9 - 3x + 2y^2) = y^2 + 5x + 12$

③ FIND EACH PRODUCT

(A) $6y(y^2 + 3y + 1) = 6y^3 + 18y^2 + 6y$

(B) $3n(n^2 - 5n + 2) = 3n^3 - 15n^2 + 6n$

3) CONTINUOUS

$$\textcircled{C} d^2(-4-3d+2d^2) = -4d^2-3d^3+2d^4 = 2d^4-3d^3-4d^2$$

$$\textcircled{D} -2xy(3x^2+2xy-4y^2) = -6x^3y-4x^2y^2+8xy^3$$

$$\textcircled{E} ab^2(12a+5b-ab) = 12a^2b^2+5ab^3-a^2b^3$$

$$\textcircled{F} x^2y^4(3xy^2-x+2y^2) = 3x^3y^6-x^3y^4+2x^2y^6$$

4) SIMPLIFY $x(4x+5)+3(2x^2-4x+1) =$
 $4x^2+5x+6x^2-12x+3 = 10x^2-7x+3$

5) FIND EACH PRODUCT.

$$\textcircled{A} (x+2)(x+5) = x^2+7x+10$$

$$\textcircled{B} (3b-2)(b-4) = 3b^2-12b-2b+8 \\ = 3b^2-14b+8$$

$$\textcircled{C} (n-5)(n+3) = n^2-2n-15$$

$$\textcircled{D} (x+2)(x^2+2x-1) = x^3+2x^2-x+2x^2+4x-2 \\ = x^3+4x^2+3x-2$$

$$\textcircled{E} (k-1)(k-3k^2) = k^2-3k^3-k+3k^2 \\ = -3k^3+4k^2-k$$

5) CONTINUOUS

(F) $(3x^2 + 2x - 1)(2x^2 - 3x + 2)$
 $6x^4 - 9x^3 + 6x^2 + 4x^3 - 6x^2 + 4x - 2x^2 + 3x - 2$
 $6x^4 - 5x^3 - 2x^2 + 7x - 2$

(G) $(2x + 1)(3x^4 + 2x^3 + x^2 - 2x + 1)$

| | | | | | |
|------|--------|--------|--------|---------|------|
| | $3x^4$ | $2x^3$ | x^2 | $-2x$ | 1 |
| $2x$ | $6x^5$ | $4x^4$ | $2x^3$ | $-4x^2$ | $2x$ |
| 1 | $3x^4$ | $2x^3$ | x^2 | $-2x$ | 1 |

$6x^5 + 7x^4 + 4x^3 - 3x^2 + 1$

(H) $(x + 1)(x - 1) = x^2 - 1$

(I) $(x + 2)(x - 2) = x^2 - 4$

(J) $(2y - 5)(2y + 5) = 4y^2 - 25$

OLD STUFF

(6) GIVEN $f(x) = 3x^2 + 1$

(A) WHAT IS $f(2)$? $f(2) = 3(2)^2 + 1 = 13$

(B) WHAT IS $f(0)$? $f(0) = 3(0)^2 + 1 = 1$

(C) FOR WHAT x VALUES IS $f(x) = 49$?

$49 = 3x^2 + 1$ $48 = 3x^2$ $16 = x^2$
 $x = 4$

7) WHAT IS THE AVERAGE RATE OF CHANGE OF $f(x) = 2x^2 + 1$ ON THE INTERVAL $x=0$ TO $x=2$?

$$\frac{f(b) - f(a)}{b - a} = \frac{f(2) - f(0)}{2 - 0} = \frac{9 - 1}{2 - 0} = \frac{8}{2} = 4$$

8) WHAT IS THE SLOPE OF THE LINE PERPENDICULAR TO THE LINE THAT PASSES THROUGH $(2, 5)$ AND $(-3, 1)$?

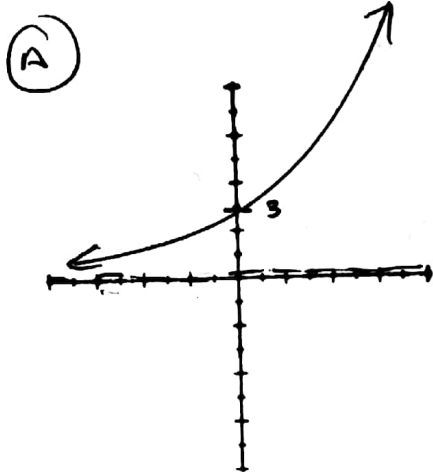
$$m = \frac{5 - 1}{2 - (-3)} = \frac{4}{5}$$

$$m_{\perp} = -\frac{5}{4}$$

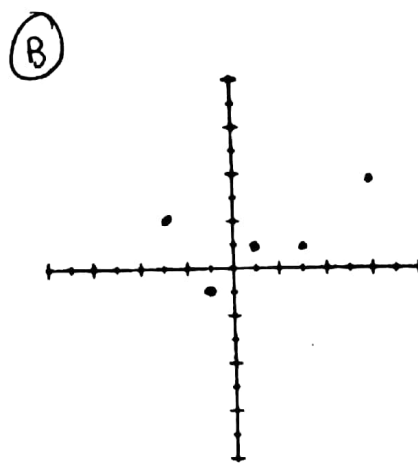
9) SOLVE $-11x - 13 > 42$

$$\begin{array}{r} -11x - 13 > 42 \\ + 13 \quad + 13 \\ \hline -11x > 55 \\ \hline \frac{-11x}{-11} > \frac{55}{-11} \end{array} \rightarrow x < -5$$

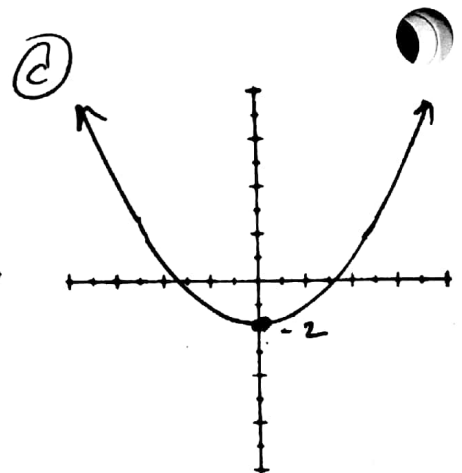
10) FIND THE DOMAIN AND RANGE FOR EACH FUNCTION GRAPHED BELOW.



D: \mathbb{R}
R: $y > 0$

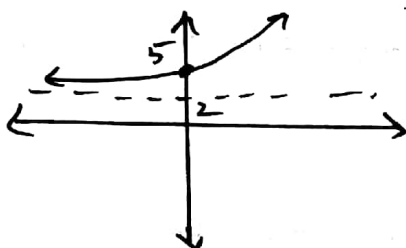


D: $\{-3, -1, 1, 3, 6\}$
R: $\{-1, 1, 2, 4\}$



D: \mathbb{R}
R: $y \geq -2$

(11) GRAPH $f(x) = 3 \cdot 2^x + 2$



12 SIMPLIFY :

(A) $(y^{10})(y^3) = y^{13}$

(B) $\left(\frac{14xyz}{244x^2y^2z^2}\right)^0 = 1$

(C) $\frac{6x^{-2}y^3z^2}{3x^3y^{-2}z^2} = \frac{2y^3z^2y^2}{x^2x^3z^2} = \frac{2y^5z^2}{x^5z^2} = \frac{2y^5}{x^5}$

(D) $\sqrt{48} = 4\sqrt{3}$

3 $\sqrt{16}$ 4 $\sqrt{80}$ $\sqrt{48}$
9 $\sqrt{5}$ 16 $\sqrt{5}$ 10 $\sqrt{5}$
2 $\sqrt{125}$ 10 $\sqrt{5}$

(E) $3\sqrt{45} + 4\sqrt{80} - 2\sqrt{125}$
 $9\sqrt{5} + 16\sqrt{5} - 10\sqrt{5} = 15\sqrt{5}$

(F) $\frac{6\sqrt{10}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{6\sqrt{50}}{5} = \frac{30\sqrt{2}}{5} = 6\sqrt{2}$

13 FIND THE 10th TERM OF EACH SEQUENCE

(A) $2, 5, 8, \dots$

$a_1 = 2$ $d = 3$ $a_{10} = 2 + (10-1)3 = 2 + 9(3) = 29$

(B) $7, -14, 28, -56, \dots$

$a_1 = 7$ $r = -2$ $a_{10} = (7)(-2)^{10-1} = (7)(-2)^9 = -3584$

(C) $28, 30, 32, \dots$

$a_1 = 28$ $d = 2$ $a_{10} = 28 + (10-1)2$
 $= 28 + 9(2) = 46$