

Week 1 Material
Pre-Test

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Simplify each of the following (2 points each):

1. $\frac{64t^3u^5}{4t^{-5}u^9}$

$$\frac{16t^3t^5}{u^9u^{-5}} = \frac{16t^8}{u^4}$$

2. $(3x^2y^{-2})^{-5}$

$$3^{1(-5)} x^{2(-5)} y^{-2(-5)} = \frac{y^{10}}{3^5 x^{10}}$$

Name each of the polynomials by degree and number of terms (2 points each):

3. $-8x^4 + 5x^3 - x^2 + 6x - 15$
Degree = 4 # of terms = 5
Quartic polynomial of 5 terms

4. $25x^3 + 1$
Degree = 3 # of terms = 2
Cubic Binomial

Simplify each of the following by performing the specified operation (2 points each):

5. $(8x + 5x^4 + 7x^3) + (4 - 6x - 5x^4)$

$$\underline{8x} + \underline{5x^4} + \underline{7x^3} + \underline{4} - \underline{6x} - \underline{5x^4}$$

$$7x^3 + 2x + 4$$

6. $(5n^2 - 3n^3 - 7n^4) - (3n^2 - 6n^4 + 3n^3)$

$$\underline{5n^2} - \underline{3n^3} - \underline{7n^4} - \underline{3n^2} + \underline{6n^4} - \underline{3n^3}$$

$$-n^4 - 6n^3 + 2n^2$$

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

$$3x(x^2 - 5) + 2(x^2 - 5)$$

$$3x^3 - 15x + 2x^2 - 10$$

$$3x^3 + 2x^2 - 15x - 10$$

8. $(5x^3 - x^2 + 6) \div (x - 4)$

$$\begin{array}{r} x-4=0 \\ +4 \quad +4 \\ \hline x=4 \end{array} \quad \begin{array}{r} 4 \overline{) 5 \quad -1 \quad 0 \quad 6} \\ \underline{4} \\ 1 \\ \underline{4} \\ 7 \\ \underline{7} \\ 0 \\ \underline{0} \\ 6 \\ \underline{4} \\ 2 \end{array}$$

$$5x^2 + 19x + 76 + \frac{304}{x-4}$$

Rewrite each polynomial pulling out the GCF of each (2 points each):

9. $x^2 - 5x$

$$x(x-5)$$

10. $21x^3y^2 - 14x^2y - 28x^2y^2$

$$7x^2y(3xy - 2 - 4y)$$

Completely factor each of the following (2 points each):

11. $9p^2 - 25$

$$\sqrt{9p^2} = 3p$$

$$\sqrt{25} = 5$$

$$(3p+5)(3p-5)$$

12. $4n^2 + 56n + 180$

$$1(45) = 45$$

1	45
3	15
+5	+9

$$n^2 + 14n + 45$$

$$n^2 + 5n + 9n + 45$$

$$(n^2 + 5n) + (9n + 45)$$

$$n(n+5) + 9(n+5)$$

$$4(n+9)(n+5)$$

13. $9x^2 - 11x - 14$

$$9(14) = 126$$

1	126
2	63
3	42
6	21
+7	-18
9	14

$$9x^2 + 7x - 18x - 14$$

$$(9x^2 + 7x) - (18x + 14)$$

$$x(9x + 7) - 2(9x + 7)$$

$$(x-2)(9x+7)$$

14. $x^4 - 16x^2 + 60$

$$1(60) = 60$$

1	60
2	30
3	20
4	15
5	12
-6	-10

$$u = x^2$$

$$So u^2 - 16u + 60$$

$$u^2 - 6u - 10u + 60$$

$$(u^2 - 6u) - (10u - 60)$$

$$u(u-6) - 10(u-6)$$

$$(u-10)(u-6)$$

$$(x^2-10)(x^2-6)$$

15. $729x^3 + 3375$

$$\sqrt[3]{729x^3} = 9x$$

$$\sqrt[3]{3375} = 15$$

$$(9x+15)(81x^2 - (9x)(15) + (15)^2)$$

$$\frac{(9x+15)}{3} \frac{(81x^2 - 135x + 225)}{3}$$

$$3 \cdot 3 \frac{(3x+5)}{3} \frac{(27x^2 - 45x + 75)}{3}$$

$$9 \cdot 3(3x+5)(9x^2 - 15x + 25)$$

$$27(3x+5)(9x^2 - 15x + 25)$$

16. $1331x^3 - 2197$

$$\sqrt[3]{1331x^3} = 11x$$

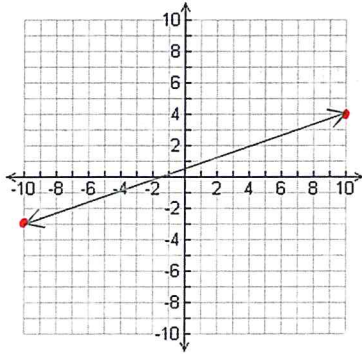
$$\sqrt[3]{2197} = 13$$

$$(11x-13)[(11x)^2 + (11x)(13) + (13)^2]$$

$$(11x-13)(121x^2 + 143x + 169)$$

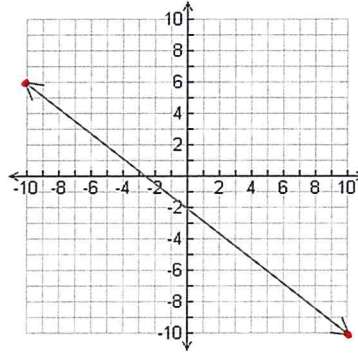
Find the Slope of the line given the graph (1 point each):

17.



$$\boxed{\frac{7}{20}}$$

18.



$$\frac{-16}{20} = \boxed{\frac{-4}{5}}$$

Find the slope of the line containing the given points (2 points each):

19. (18, -21) & (5, 9)

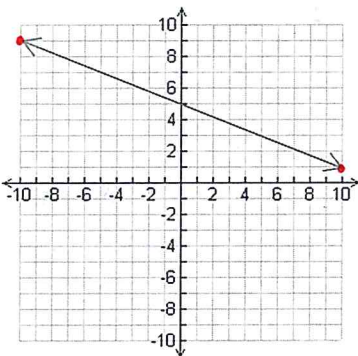
$$m = \frac{9 - (-21)}{5 - 18} = \frac{9 + 21}{-13} = \boxed{\frac{30}{-13}}$$

20. (-7, -2) & (10, -8)

$$m = \frac{-8 - (-2)}{10 - (-7)} = \frac{-8 + 2}{10 + 7} = \boxed{\frac{-6}{17}}$$

Write the Linear Equation in Slope-Intercept form given the graph (2 points):

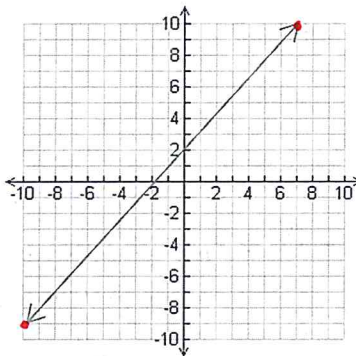
21.



$$\begin{aligned} &(-10, 9) \quad (10, 1) \\ m &= \frac{1 - 9}{10 + 10} = \frac{-8}{20} \\ m &= \frac{-2}{5} \\ y &= \frac{-2}{5}x + b \\ 1 &= \frac{-2}{5}(10) + b \\ 1 &= -4 + b \\ +4 \quad +4 \\ \hline 5 &= b \end{aligned}$$

$$\boxed{y = \frac{-2}{5}x + 5}$$

22.



$$\begin{aligned} &(-10, -9) \quad (7, 10) \\ m &= \frac{10 + 9}{7 + 10} = \frac{19}{17} \\ y &= \frac{19}{17}x + b \\ 10 &= \frac{19}{17}(7) + b \\ 10 &= \frac{133}{17} + b \\ \frac{-133}{17} \quad \frac{-133}{17} \\ \hline \frac{37}{17} \end{aligned}$$

$$\boxed{y = \frac{19}{17}x + \frac{37}{17}}$$

Write the Linear Equation in Slope-Intercept form using the given information (2 points):

<p>23. $m = 3$ & $(6, -7)$</p> $y = 3x + b$ $-7 = 3(6) + b$ $-7 = 18 + b$ $\begin{array}{r} -18 \quad -18 \\ \hline -25 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = 3x - 25$</div>	<p>24. $m = -5$ & $(10, -15)$</p> $y = -5x + b$ $-15 = -5(10) + b$ $-15 = -50 + b$ $\begin{array}{r} +50 \quad +50 \\ \hline 35 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = -5x + 35$</div>
<p>25. $m = -0.125$ & $(24, -10)$</p> $y = -0.125x + b$ $-10 = -0.125(24) + b$ $-10 = -3 + b$ $\begin{array}{r} +3 \quad +3 \\ \hline -7 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = -0.125x - 7$</div>	<p>26. $m = 0.9$ & $(81, 16)$</p> $y = 0.9x + b$ $16 = 0.9(81) + b$ $16 = \frac{9}{10}(81) + b$ $16 = \frac{729}{10} + b$ $\begin{array}{r} -\frac{729}{10} \quad -\frac{729}{10} \\ \hline -\frac{569}{10} = b \end{array}$ $y = 0.9x - \frac{569}{10}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = 0.9x - 56.9$</div>

Write the Linear Equation in Slope-Intercept form using the given information (2 points):

<p>27. $(9, 52)$ & $(-5, -32)$</p> $m = \frac{-32 - 52}{-5 - 9} = \frac{-84}{-14} = 6$ $y = 6x + b$ $-32 = 6(-5) + b$ $-32 = -30 + b$ $\begin{array}{r} +30 \quad +30 \\ \hline -2 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = 6x - 2$</div>	<p>28. $(13, -114)$ & $(-2, 21)$</p> $m = \frac{21 + 114}{-2 - 13} = \frac{135}{-15} = -9$ $y = -9x + b$ $21 = -9(-2) + b$ $21 = 18 + b$ $\begin{array}{r} -18 \quad -18 \\ \hline 3 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = -9x + 3$</div>
<p>29. $(-10, 103)$ & $(-4, 37)$</p> $m = \frac{37 - 103}{-4 + 10} = \frac{-66}{6} = -11$ $y = -11x + b$ $37 = -11(-4) + b$ $37 = 44 + b$ $\begin{array}{r} -44 \quad -44 \\ \hline -7 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = -11x - 7$</div>	<p>30. $(-6, -35)$ & $(4, 45)$</p> $m = \frac{45 + 35}{4 + 6} = \frac{80}{10} = 8$ $y = 8x + b$ $45 = 8(4) + b$ $45 = 32 + b$ $\begin{array}{r} -32 \quad -32 \\ \hline 13 = b \end{array}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$y = 8x + 13$</div>