**Hilltop High School**
**Math 9 Review**

***Complete this review package to help ensure you are ready for Math 10C!***


## Operations with positive and negative numbers

**Multiplying and Dividing positive and negative numbers:**

- If the signs are the same (both positive or both negative) the answer will be positive.
- If the signs are different (one positive and one negative), the answer will be negative.

1. $3.7 \times (-8.6) =$ -31.82
2. $(-4.6) \times 9.2 =$ -43.32
3. $22 \times 3.9 =$ 85.8
4. $8.3 \times 5.3 =$ 43.99
5. $(-7.2) \times (-3.5) =$ 25.2
6. $5.3 \times 55 =$ 291.5
7. $(3.2) \times (-5.1) \times (1.2) =$ -19.584
8. $(-6.4)(3.1)(-5) =$ 99.2
9. $(4.1)(-4.7)(7.4) =$ -142.598
10. $(8.4)(-7.6)(-2.6) =$ 165.984
11. $(-20) \div 5 =$ -4
12. $\frac{-157.5}{10.5} =$ -15
13. $10.8 \div (-1.2) =$ -9
14. $\frac{73.8}{-8.2} =$ -9
15. $(93.6) \div (-3.6) =$ -26
16. $\frac{-84.5}{-6.5} =$ 13
17. $122.1 \div (-3.3) =$ -37
18. $\frac{99.4}{7.1} =$ 14
19. $(-25.6) \div 6.4 =$ -4
20. $\frac{-88.4}{-6.8} =$ 13

**Adding and Subtracting positive and negative numbers:**

| | | |
|---|---|---|
| Adding a positive number<br>Subtracting a negative number | $3 + 5 = 8$<br>$2 - (-8) = 10$ | **Addition** (move to the right on a number line) |
| Subtracting a positive number<br>Adding a negative number | $7 - 4 = 3$<br>$9 + (-5) = 4$ | **Subtraction** (move to the left on a number line) |

1. $10 + (-6) =$ 4
2. $(-7) + (-3) =$ -10
3. $5.4 - 3.6 =$ 1.8
4. $7.2 + (-1.6) =$ 5.6
5. $-8.6 - 4.1 =$ -12.7
6. $-2.8 + 1.5 =$ -1.3
7. $17.6 + 8.3 =$ 25.9
8. $5.7 - 9.2 =$ -3.5
9. $9.6 + (-9.7) =$ -0.1
10. $21.6 - 25.4 =$ -3.8
11. $85.7 + (-17.2) =$ 68.5
12. $123 - 654 =$ -531

13. $(-95.4) + (-45.9) =$ $-141.3$

14. $1032.4 - 85.2 =$ $947.2$

15. $14.573 + (-4.753) =$ $9.82$

16. $67.381 - 45.972 =$ $21.409$

17. $(-12.7) + (-8.1) - (-6.4) + 15.6 =$ $1.2$

18. $18.7 - (-7.1) + 26.4 - (-8.5) + (-19.8) - 8.6 =$ $32.3$

19. $15.7 + (-8.9) - 5.6 + 7.1 - (4.8) =$ $3.5$

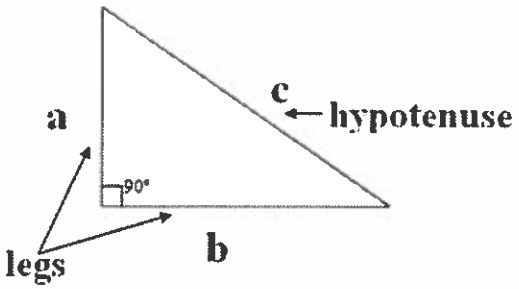
20. $(4.5) + 8.1 - 7.6 - (-9.2) + 6.2 - 4.2 + (8.9) - 2.9 =$ $22.2$

***More Practice*** – the more you practice mental math, the better you will get and the faster you will get without having to resort to using your calculator.

- Roll several dice and add, subtract, or multiply the values without using a calculator.
- Using a deck of cards, flip up two or more cards and add or multiply the values together. For an extra challenge, let the black cards be positive numbers and the red cards be negative. You can also flip them into fractions to add, subtract, multiply or divide.

**Pythagorean Theorem**

Helpful Reference:
www.mathsisfun.com/pythagoras.html



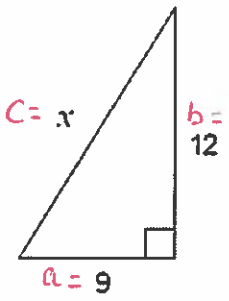

$a^2 + b^2 = c^2$

Tips:

- Identify and label each side
- Fill in the blanks in your formula
- Solve for the unknown
- Remember to take the square root to find the final answer!

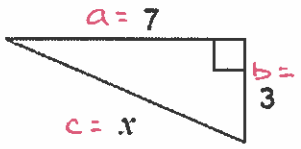
Solve for the unknown side in each of these triangles. Round to the nearest tenth if necessary.

1.



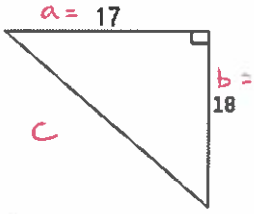

$a^2+b^2=c^2$
$9^2+12^2=c^2$
$81+144=c^2$
$c^2=225$
$c=\sqrt{225}$
$c=15$

2.



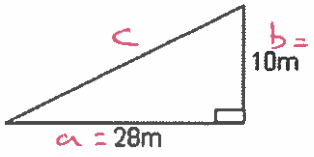

$a^2+b^2=c^2$
$7^2+3^2=c^2$
$49+9=c^2$
$c^2=58$
$c=\sqrt{58}$
$c=7.6$

3.



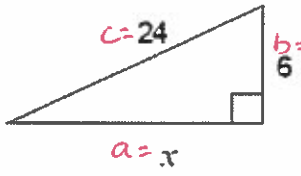

$a^2+b^2=c^2$
$17^2+18^2=c^2$
$289+324=c^2$
$c^2=613$
$c=\sqrt{613}=24.8$

4.



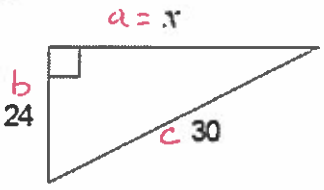

$a^2+b^2=c^2$
$28^2+10^2=c^2$
$784+100=c^2$
$c^2=884$
$c=\sqrt{884}=29.7$

5.



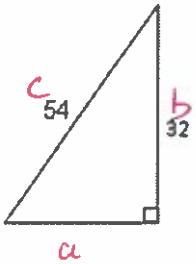

$a^2+b^2=c^2$
$a^2+6^2=24^2$
$a^2+36=576$
$a^2=576-36=540$
$a=\sqrt{540}=23.2$

6.



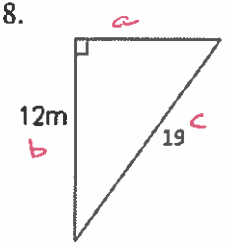

$a^2+b^2=c^2$
$a^2+24^2=30^2$
$a^2+576=900$
$a^2=900-576=324$
$a=\sqrt{324}=18$

7.



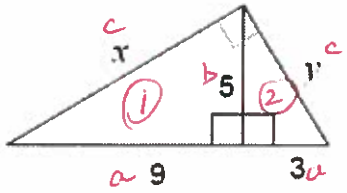

$a^2+b^2=c^2$
$a^2+32^2=54^2$
$a^2+1024=2916$
$a^2=2916-1024$
$a^2=1892$
$a=\sqrt{1892}=43.5$

8.




$a^2+b^2=c^2$
$a^2+12^2=19^2$
$a^2+144=361$
$a^2=361-144=217$
$a=\sqrt{217}=14.7$

9.




△①: $a^2+b^2=c^2$

$9^2+5^2=x^2$

$81+25=x^2$

$x^2=106$

$x=\sqrt{106}=10.3$

△②: $a^2+b^2=c^2$

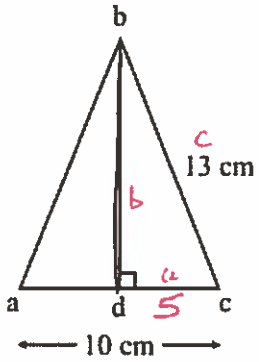
$3^2+5^2=y^2$

$9+25=y^2$

$y^2=34$

$y=\sqrt{34}=5.8$

10. What is the length of **bd**?




$a^2+b^2=c^2$

$5^2+b^2=13^2$

$25+b^2=169$

$b^2=169-25=144$

$b=\sqrt{144}$

$b=12$

11. a = 12 ; b = 5; c = 13 (see above △!)

$15^2+b^2=17^2$

$b^2=17^2-15^2=289-225=64$

$b=\sqrt{64}=8$

12. a = 15 ; b = 8 ; c = 17

13. a = 3.5 ; b = 2 ; c = 4

$a^2+2^2=4^2$

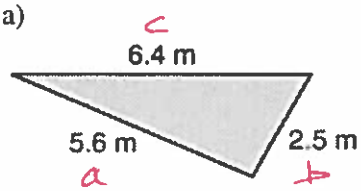
$a^2+4=16$

$a^2=16-4=12$

$a=\sqrt{12}=3.5$

14. Are these right triangles? How do you know?

a)




$a^2+b^2$

$5.6^2+2.5^2$

$31.36+6.25=37.61$

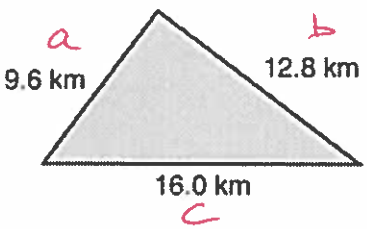
$c^2=6.4^2$

$=40.96$

Not equal

Not a Rt △

b)




$9.6^2+12.8^2$

$=92.16+163.84$

$=256$

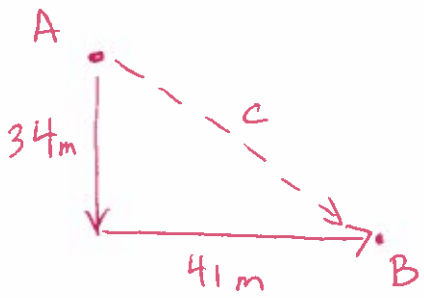
$16^2=256$

EQUAL

Rt △

15. To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the *nearest meter*, how many meters would be saved if it were possible to walk through the pond?

DRAW A DIAGRAM!




$34^2+41^2=c^2$

$1156+1681=c^2$

$c^2=2837$

$c=53m$

total walked:

$34+41=75m$

meters saved

$=75-53$

$=22m$

## Fraction Operations

Simplify the following fractions:

1. $\frac{15}{18} = \frac{5}{6}$
2. $\frac{42}{70} = \frac{6}{10} = \frac{3}{5}$
3. $\frac{39}{52} = \frac{3}{4}$
4. $\frac{65}{80} = \frac{13}{16}$
5. $\frac{132}{96} = \frac{11}{8}$
6. $\frac{102}{255} = \frac{2}{5}$

Multiplying and dividing fractions. Your final answer should always be in simplest form:

Simplify before you multiply if possible!

1. $\frac{6}{5} \cdot \frac{4}{5} = \frac{24}{25}$
2. $\frac{8}{9} \cdot \frac{12}{16} = \frac{96}{144} = \frac{2}{3}$
3. $\frac{14}{20} \cdot \frac{5}{8} = \frac{7}{16}$
4. $\frac{26}{1} \cdot \frac{21}{39} = \frac{6}{3} = \frac{2}{1} = 2$
5. $\frac{15}{24} \cdot \frac{12}{10} = \frac{3}{4}$
6. $\frac{18}{22} \cdot \frac{4}{6} = \frac{6}{11}$
7. $\frac{6}{5} \div \frac{4}{5} = \frac{6}{5} \times \frac{5}{4} = \frac{6}{4} = \frac{3}{2}$
8. $\frac{8}{9} \div \frac{12}{16} = \frac{2}{9} \times \frac{16}{12} = \frac{32}{27}$
9. $\frac{14}{20} \div \frac{5}{8} = \frac{14}{20} \times \frac{8}{5} = \frac{56}{50} = \frac{28}{25}$
10. $\frac{6}{7} \div \frac{21}{9} = \frac{2}{7} \times \frac{9}{21} = \frac{18}{49}$
11. $\frac{15}{24} \div \frac{12}{10} = \frac{15}{24} \times \frac{10}{12} = \frac{25}{48}$
12. $\frac{18}{22} \div \frac{4}{6} = \frac{18}{22} \times \frac{6}{4} = \frac{27}{22}$

Adding and Subtracting fractions. Your final answer should always be in simplest form:

1. $\frac{7}{10} + \frac{9}{10} = \frac{16}{10} = \frac{8}{5}$
2. $\frac{4}{9} + \frac{7}{3} = \frac{4}{9} + \frac{21}{9} = \frac{25}{9}$
3. $\frac{3}{4} + \frac{5}{6} = \frac{9}{12} + \frac{10}{12} = \frac{19}{12}$
4. $\frac{6}{7} + \frac{3}{4} = \frac{24}{28} + \frac{21}{28} = \frac{45}{28}$
5. $\frac{7}{15} + \frac{5}{6} = \frac{14}{30} + \frac{25}{30} = \frac{39}{30}$
6. $\frac{1}{21} + \frac{3}{14} = \frac{2}{42} + \frac{9}{42} = \frac{11}{42}$
7. $\frac{16}{20} - \frac{5}{30} = \frac{48}{60} - \frac{10}{60} = \frac{38}{60} = \frac{19}{30}$
8. $\frac{10}{11} - \frac{10}{55} = \frac{50}{55} - \frac{10}{55} = \frac{40}{55} = \frac{8}{11}$
9. $\frac{12}{27} - \frac{2}{6} = \frac{24}{54} - \frac{18}{54} = \frac{6}{54} = \frac{1}{9}$
10. $\frac{5}{6} - \frac{4}{21} = \frac{35}{42} - \frac{8}{42} = \frac{27}{42} = \frac{9}{14}$
11. $\frac{3}{6} - \frac{1}{9} = \frac{9}{18} - \frac{2}{18} = \frac{7}{18}$
12. $\frac{3}{14} - \frac{4}{21} = \frac{9}{42} - \frac{8}{42} = \frac{1}{42}$

exponent → $5^2$ ← power; base → 5

## Exponent laws

| Exponent Law | Example |
|---|---|
| Product Law<br>$x^a \cdot x^b = x^{a+b}$ | $2^4 \cdot 2^5 = 2^9$ |
| Quotient Law<br>$\frac{x^a}{x^b} = x^{a-b}$ | $\frac{5^6}{5^2} = 5^4$ |
| Power of a Power<br>$(x^a)^b$ | $(3^5)^2 = 3^{10}$ |
| Power of a Product<br>$(x \cdot y)^a = x^a \cdot y^a$ | $(4m)^2 = 4^2 \cdot m^2 = 16 \cdot m^2$ |
| Power of a Quotient<br>$\left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$ | $\left(\frac{7}{9}\right)^2 = \frac{7^2}{9^2} = \frac{49}{81}$ |
| Zero Power<br>$x^0 = 1$ | $523^0 = 1$ |

Simplify each of the following into a single power. Do not evaluate:

1. $4^4 \cdot 4^7 =$ $4^{4+7} = 4^{11}$
2. $52^3 \cdot 52^7 =$ $52^{10}$
3. $1492^{18} \cdot 1492^{22} \cdot 1492^{15} =$ $1492^{55}$
4. $1867^3 \cdot 1867^6 \cdot 1867^9 =$ $1867^{18}$
5. $\frac{7^9}{7^4} =$ $7^5$
6. $\frac{h^{12}}{h^5} =$ $h^7$
7. $\frac{987^{65}}{987^{43}} =$ $987^{22}$
8. $\frac{2016^{365}}{2016^{244}} =$ $2016^{121}$
9. $(3^5)^7 =$ $3^{35}$
10. $(p^3)^8 =$ $p^{24}$
11. $(432^{18})^{37} =$ $432^{666}$
12. $(m^4)^{13} =$ $m^{52}$
13. $(3 \cdot 7)^8 =$ $3^8 \cdot 7^8$
14. $(5 \cdot c)^2 =$ $5^2 \cdot c^2$
15. $(2 \cdot w)^7 =$ $2^7 \cdot w^7$
16. $(9 \cdot x \cdot y)^5 =$ $9^5 x^5 y^5$
17. $\left(\frac{9}{4}\right)^2 =$ $\frac{9^2}{4^2}$
18. $\left(\frac{x}{5}\right)^3 =$ $\frac{x^3}{5^3}$
19. $\left(\frac{17}{29}\right)^6 =$ $\frac{17^6}{29^6}$
20. $\left(\frac{100}{256}\right)^{512} =$ $\frac{100^{512}}{256^{512}}$
21. $5^0 =$ $1$
22. $827^0 =$ $1$

Simplify each expression using the exponent laws:

1. $(2^2)^2 \cdot (2^3)^4 =$ $2^4 \cdot 2^{12} = 2^{16}$

2. $\frac{4^7 \cdot 4^0}{4^3} =$ $4^4$

3. $\frac{7^5 \cdot 7^{12}}{(7^2)^3 \cdot 7^4} =$ $\frac{7^{17}}{7^6 \cdot 7^4} = \frac{7^{17}}{7^{10}} = 7^7$

4. $23^6 \cdot (23^3)^5 \cdot 23^2 =$ $23^6 \cdot 23^{15} \cdot 23^2 = 23^{23}$

5. $\left(\frac{243^8 \cdot 243^9}{243^4}\right)^0 \cdot 243^5 =$ $243^0 \cdot 243^5 = 243^5$

6. $x^5 \cdot x^3 \cdot (x^7)^3 =$ $x^5 \cdot x^3 \cdot x^{21} = x^{29}$

7. $(2x)^5 \cdot (4y)^3 =$ $2^5 x^5 \cdot 4^3 \cdot y^3 = 2^5 \cdot 4^3 \cdot x^5 y^3 = 32 \cdot 64 x^5 y^3$
$= 2048 x^5 y^3$

8. $\frac{2y^3 \cdot 3xy^2}{3x^2y^4} =$ $\frac{2y}{x}$

9. $\left(\frac{12m^7 \cdot 4m^5}{6m^2}\right)^2 =$ $\frac{12^2 m^{14} \cdot 4^2 m^{10}}{6^2 m^4} = \frac{12^2 \cdot 4^2}{6^2} m^{20} = 64m^{20}$

10. $\left(\frac{5w^6}{2w^3}\right)\left(\frac{6w^3}{3w}\right)^2\left(\frac{3w^8}{10w^5}\right) =$ $\frac{6 w^6 \cdot w^6 \cdot w^8}{9 w^3 \cdot w^2 w^5} = \frac{2}{3} w^{10}$

**Order of Operations**

**B**rackets ( )
**E**xponents $n^x$
**D**ivide ÷
**M**ultiply × } in the order they appear
**A**dd +
**S**ubtract − } in the order they appear

Order of operations - BEDMAS

What is the first step for each of the following?

1. $(7 + 90 \div 9) + 56 \div 7$
2. $10 - 7 + 12 \div 6 + 60 \div 6$
3. $10 + 5 + 7^2 + 6^2 + 8$
4. $10 + 7 + 8^3 + (10 + 50 \div 10)$
5. $9 + 5 + 36 \div 4 + 54 \div 9$
6. $10 + 12 \div 6 + 6^3 + 2^3$
7. $5 + 20 \div 4 + 56 \div 8$
8. $9 + (10 \div 2 + 3^2) + 5$
9. $8 + (90 \div 9 \times 5) \times 6$
10. $8 + 7^3 + 2 \times 2 + 14 \div 2$

Evaluate using the order of operations.

1. $51 - 21 \times 2 =$
$= 51 - 42$
$= 9$

2. $9 - (10 \div (-2) - 5) =$
$= 9 - (-5 - 5)$
$= 9 - (-10) = 19$

3. $40 \div 1 + 3 - (3 \times 7) + 7 - 5 =$
$= 40 + 3 - 21 + 7 - 5$
$= 24$

4. $(4 + 9 + 16 \div 4) - 8 - 3 \times 5 =$
$= (4 + 9 + 4) - 8 - 15$
$= 17 - 8 - 15 = -6$

5. $(15 \div 5 + 6 + 9) \times 4 \times 2 + 7 =$
$= (3 + 6 + 9) \times 4 \times 2 + 7$
$= 18 \times 4 \times 2 + 7$
$= 144 + 7$
$= 151$

6. $(5 - 6 \times 9 + 6) \times 9 + 3 - 85 =$
$= (5 - 54 + 6) \times 9 + 3 - 85$
$= -43 \times 9 + 3 - 85$
$= -387 + 3 - 85$
$= -384 - 85$
$= -469$

7. $4 - 9 + (7 \times 11) \times 5 + 7 + 8 =$
$= 4 - 9 + 77 \times 5 + 7 + 8$
$= 4 - 9 + 385 + 7 + 8$
$= 395$

8. $(60 \div 3 + 4 \times 7 \times 9) \times 2 - 8 =$
$= (20 + 28 \times 9) \times 2 - 8$
$= (20 + 252) \times 2 - 8$
$= 272 \times 2 - 8$
$= 544 - 8$
$= 536$

9. $(9 \times 36 \div 6 - 5 \times 3) + 2 + 6 =$
$= (324 \div 6 - 5 \times 3) + 2 + 6$
$= (54 - 15) + 2 + 6$
$= 39 + 2 + 6$
$= 47$

10. $(9 - 84 \div 2 \times 5 + 5 + 6) + 2 =$
$= (9 - 42 \times 5 + 5 + 6) + 2$
$= (9 - 210 + 5 + 6) + 2$
$= (-201 + 5 + 6) + 2$
$= -190 + 2$
$= -188$

**Equation solving**

- combine like terms
- make a variable side and a number side of each equation
- opposite operations

1. $5x - 5 + 6x = 72$

$11x - 5 = 72$
$+5 \quad +5$
$\frac{11x}{11} = \frac{77}{11}$
$x = 7$

2. $3(b - 6) + 8 - b = -2$

$3b - 18 + 8 - b = -2$
$2b - 18 + 8 = -2$
$2b - 10 = -2$
$+10 \quad +10$
$\frac{2b}{2} = \frac{8}{2}$
$b = 4$

3. $4(2d) - 18 - 3d = 32$

$8d - 18 - 3d = 32$
$+18 \quad +18$
$\frac{5d}{5} = \frac{50}{5}$
$d = 10$

4. $3y - 4y - 2y = -13$

$\frac{-3y}{-3} = \frac{-13}{-3}$
$y = \frac{13}{3}$

5. $2(7h) + 9 - 3h = -24$

$14h + 9 - 3h = -24$
$11h + 9 = -24$
$-9 \quad -9$
$\frac{11h}{11} = \frac{-33}{11}$
$h = -3$

6. $2(2m) - 4 - 2m = 14$

$4m - 4 - 2m = 14$
$2m - 4 = 14$
$+4 \quad +4$
$\frac{2m}{2} = \frac{18}{2}$
$m = 9$

7. $-k + 5 + 2(k + 7) = 12$

$-k + 5 + 2k + 14 = 12$
$k + 5 + 14 = 12$
$k + 19 = 12$
$-19 \quad -19$
$k = -7$

8. $3y - 4(y + 2) = 10$

$3y - 4y - 8 = 10$
$-1y - 8 = 10$
$+8 \quad +8$
$-1y = 18$
$y = -18$

9. $4(c + 5) - 2c = 12$

$4c + 20 - 2c = 12$
$2c + 20 = 12$
$-20 \quad -20$
$\frac{2c}{2} = \frac{-8}{2}$
$c = -4$

10. $2(2x) + 6 - 3x = -3$

$4x + 6 - 3x = -3$
$x + 6 = -3$
$-6 \quad -6$
$x = -9$

## Polynomials

Group like terms
watch your signs!

### Adding and Subtracting Polynomials

1. $(3x+4)+(4x+7)=$ $3x+4+4x+7 = 7x+11$
2. $(9x+2)+(7x-5)=$ $9x+2+7x-5 = 16x-3$
3. $(5x^2+3x+2)+(9x^2-7x-3)=$ $5x^2+3x+2+9x^2-7x-3 = 14x^2-4x-1$
4. $(4x^2-5x-6)+(5x^2+2x-7)=$ $4x^2-5x-6+5x^2+2x-7 = 9x^2-3x-13$
5. $(6x^2+1)+(8x^2+2x-7)=$ $6x^2+1+8x^2+2x-7 = 14x^2+2x-6$
6. $(13y^2+8y-11)+(13y^3+4y^2-2)=$ $13y^2+8y-11+13y^3+4y^2-2 =$ $= 13y^3+17y^2+8y-13$
7. $(4y^5+3y^4-2y^2+6)+(5y^3-7y+5)=$ $4y^5+3y^4+5y^3-2y^2-7y+11$
8. $(8m^2+3m^3+1)+(7m+3m^2-5)=$ $3m^3+11m^2+7m-4$
9. $(a^2+a-2)+(9a^2-a-2)=$ $10a^2-4$
10. $(6k^2-6k+3)+(12k^2-12k+6)=$ $18k^2-18k+9$
11. $(4q^2-19q+15)+(-18q^2+15q+16)=$ $-14q^2-4q+31$
12. $(7x+4)-(3x+2)=$ $7x+4-3x-2 = 4x+2$
13. $(9x+6)-(4x-3)=$ $9x+6-4x+3 = 5x+9$
14. $(8x^2-8x+5)-(4x^2+4x-7)=$ $8x^2-8x+5-4x^2-4x+7 = 4x^2-12x+12$
15. $(7x^2-2x+3)-(6x^2+9x+8)=$ $7x^2-2x+3-6x^2-9x-8 = x^2-11x-5$
16. $(16n^2+14n-17)-(11n^2-6n-6)=$ $16n^2+14n-17-11n^2+6n+6 = 5n^2+20n-11$
17. $(13p^2-21p-16)-(24p^2+3p+11)=$ $13p^2-21p-16-24p^2-3p-11 = -11p^2-24p-27$
18. $(63f^2+81f-55)-(34f^2+96f-87)=$ $63f^2+81f-55-34f^2-96f+87$ $= 29f^2-15f+32$
19. $(76g^2+53g-61)-(-24g-47g+39)=$ $76g^2+53g-61+24g+47g-39$ $= 76g^2+124g-100$
20. $(86m^2-23m+35)-(44m^2+19m-7)=$

$= 86m^2-23m+35-44m^2-19m+7$

$= 42m^2-42m+42$

Multiplying Polynomials

1. $2(5x + 4) =$ $10x + 8$
2. $3(4x + 7) =$ $12x + 21$
3. $8(2x^2 + 6x - 5) =$ $16x^2 + 48x - 40$
4. $4(4t^2 + 12t - 7) =$ $16t^2 + 48t - 28$
5. $6(8h^2 - 4h + 9) =$ $48h^2 - 24h + 54$
6. $2x(3x^2 + 5x - 7) =$ $6x^3 + 10x^2 - 14x$
7. $3c(5c^2 - 7c + 1) =$ $15c^3 - 21c^2 + 3c$
8. $5.1y(9.2y^2 + 6.2y - 8.7) =$ $46.92y^3 + 31.62y^2 - 44.37y$
9. $12t(56t^2 + 13t - 23) =$ $672t^3 + 156t^2 - 276t$
10. $2.3h(83h^2 - 74h - 41) =$ $190.9h^3 - 170.2h^2 - 94.3h$

Dividing Polynomials

1. $\frac{(6x^2+14x+8)}{2} =$ $3x^2 + 7x + 4$
2. $\frac{(27t^2-15t+12)}{3} =$ $9t^2 - 5t + 4$
3. $\frac{(24k^2+44k-76)}{4} =$ $6k^2 + 11k - 19$
4. $\frac{16x^2+22x}{2x} =$ $8x + 11$
5. $\frac{(105f^2-80f)}{5f} =$ $21f - 16$