

1. Add: $\sqrt{12} + 2\sqrt{75}$

$$\begin{array}{r} \sqrt{12} + 2\sqrt{75} \\ \sqrt{3 \cdot 4} + 2\sqrt{25 \cdot 3} \\ \sqrt{2 \cdot 2} + 2 \cdot 5\sqrt{3} \end{array}$$

$$2\sqrt{3} + 2 \cdot 5\sqrt{3}$$

$$2\sqrt{3} + 10\sqrt{3} = 12\sqrt{3}$$

2. Multiply out to polynomial form: $(3x-4)^2$

$$\begin{aligned} (3x-4)(3x-4) &= 9x^2 - 12x + 16 \\ &\quad - 12x \\ &= 9x^2 - 24x + 16 \end{aligned}$$

3. Simplify: $\frac{(3x^2i)^2}{18x}$

$$\frac{3^2 x^4 i^2}{18x} = \frac{-9x^4}{18x}$$

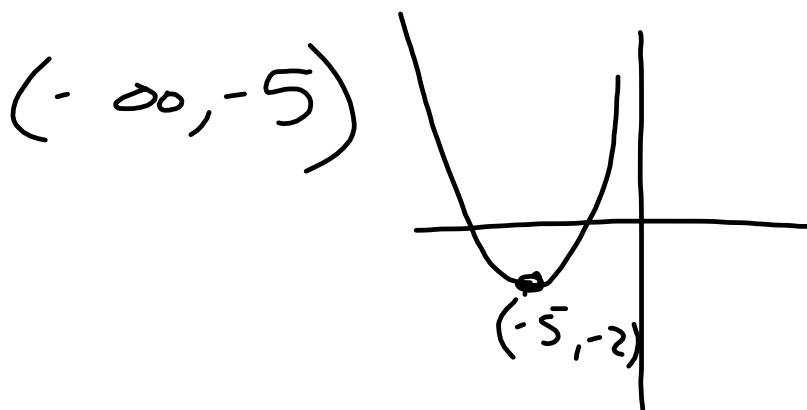
$i^2 = -1$

$$= \frac{-1x^3}{2}$$

4. Given that $f(x) = x^2$, write a function that represents $f(x) + 6$.

$$x^2 + 6$$

5. Given the graph at the right, on which interval is the function decreasing?



6. Using the same graph on the right, what is the average rate of change on the interval $[-7, -5]$?

$$x_1 \quad x_2$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - 2}{-5 - (-7)} = \frac{-4}{2} = -2$$

7. Identify the vertex of the quadratic function: $h(x) = (x+3)^2 - 9$
 $(x-h)^2 + k$

vertex: (h, k)

$$(-3, -9)$$

8. Solve for x : $x^2 + 4x - 12 = 0$
 $ax^2 + bx + c = 0$

$$(x+6)(x-2) = 0$$

$$x = -6, 2$$

$$\begin{array}{r} 6 \quad -12 \\ \times \quad -2 \\ \hline 4 \end{array}$$

9. Solve for x: $ax^2 + bx + c$
 $x^2 + 7x - 12 = 0$

~~3~~ ~~12~~ ~~4~~ ~~12~~ ~~6~~ ~~34~~

$$= \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(-12)}}{2(1)}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

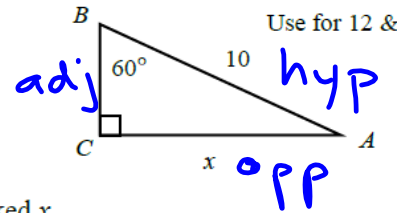
$$\frac{-7 \pm \sqrt{97}}{2} = x$$

ii) $\sqrt{N} M = \frac{ST}{\sqrt{N}}$

$\frac{M\sqrt{N}}{T} = \frac{ST}{\sqrt{N}}$
 $S = \frac{M\sqrt{N}}{T}$

12. Using the triangle at the right, what is the value of $\cos B$?

$$\angle B = 60 \quad \cos(60) = \frac{1}{2}$$



13. Using the triangle at the right, calculate the approximate side length marked x .

$$\sin B = \frac{\text{opp}}{\text{hyp}} \quad 10 \sin(60) = \frac{x}{10} \quad +10$$

$$x = 10 \sin(60) = 8.66$$

14. Given that $\triangle ABC \sim \triangle KLM$, and that $AB = 8$, $BC = 10$, $KL = 16$. Calculate the length JK .

$$\frac{JK}{AB} = \frac{KL}{BC} \quad \cancel{8} \cdot \frac{x}{\cancel{8}} = \frac{16}{10} \cdot 8$$

$$x = 12.8$$

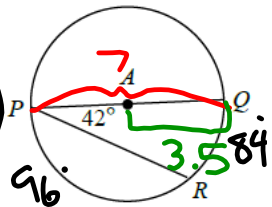
15. Identify the center and radius of the circle given by the following equation: $(x+1)^2 + (y-4)^2 = 9$?

center: (h, k) $r = \text{radius}$ $(x-h)^2 + (y-k)^2 = r^2$

center: $(-1, 4)$ radius: $\sqrt{9} = 3$

16. Referring to circle A , what is the measure of \widehat{PR} in degrees?

$\widehat{QR} = 42 : 2 = 84^\circ$ $\widehat{PR} = 180 - 84 = 96^\circ$



17. Referring to circle A , calculate the approximate length of PR in cm if $PQ = 7$ cm.

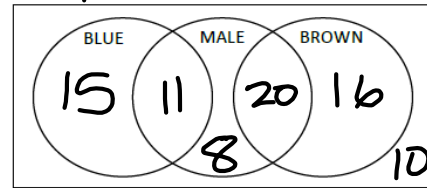
$L = \frac{\pi r \theta}{180} = \frac{\pi (3.5) (96^\circ)}{180} = 5.86 \text{ cm}$

18. The two-way table shows counts of individuals from a recent survey according to gender and eye color. What is $P(\text{MALE} | \text{BROWN})$?

	BROWN	BLUE	OTHER	TOTAL
MALE	20	11	8	39
FEMALE	16	15	10	41
TOTAL	36	26	18	80

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{20}{36} = \frac{5}{9}$$

19. Fill in the Venn Diagram with counts using the data obtained in the survey from the previous question.



20. Using the information from the previous two problems, the events MALE and BROWN would best be described as:

- A. ~~Mutually Exclusive~~ B. ~~Independent~~ C. Neither A nor B.

$$P(A) \cdot P(B) = P(A \cap B)$$

$$\frac{39}{80} \cdot \frac{36}{80} = \frac{20}{80}$$

$$= .22 \neq .25$$